

MACWORLD

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NEW

Quadra 950

APPLE'S
MOST
POWERFUL
COMPUTER
PAGE 148

22 Gray-Scale and Monochrome Monitors

BEST PRODUCT?
LOWEST COST? BEST BUY?

MW LAB

OCR: Speeding Data Entry

11 PRODUCTS TESTED
AND COMPARED

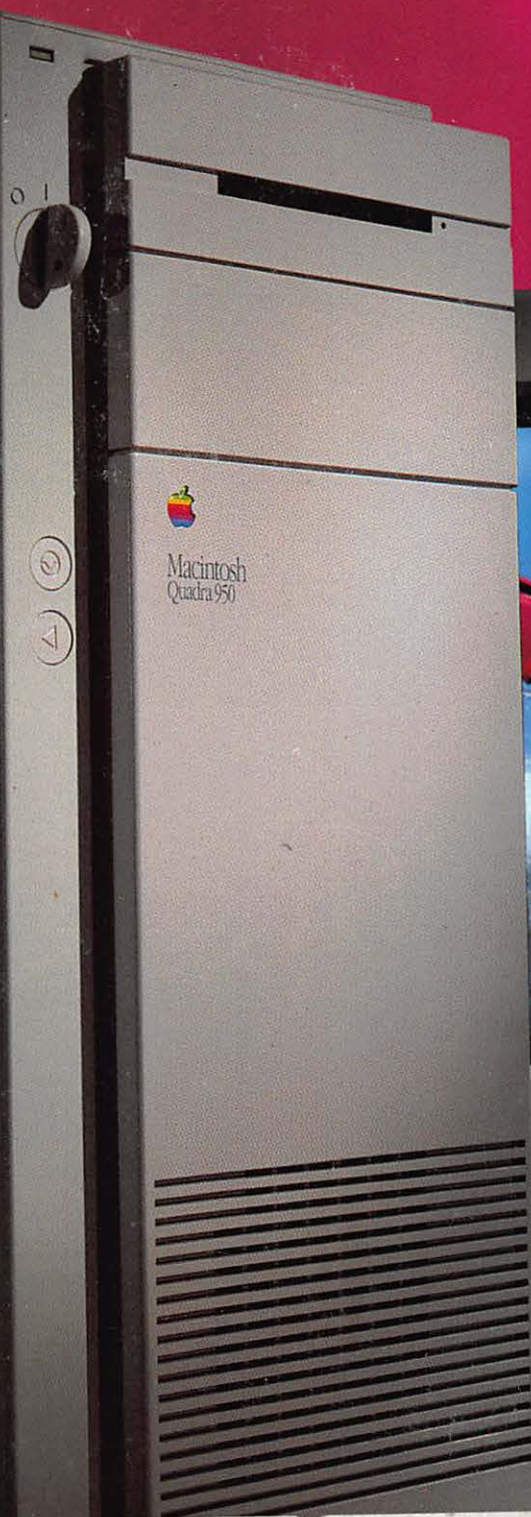
MW LAB

Presentation Software

8 PRODUCT REVIEWS—
WHICH SHOULD YOU BUY?

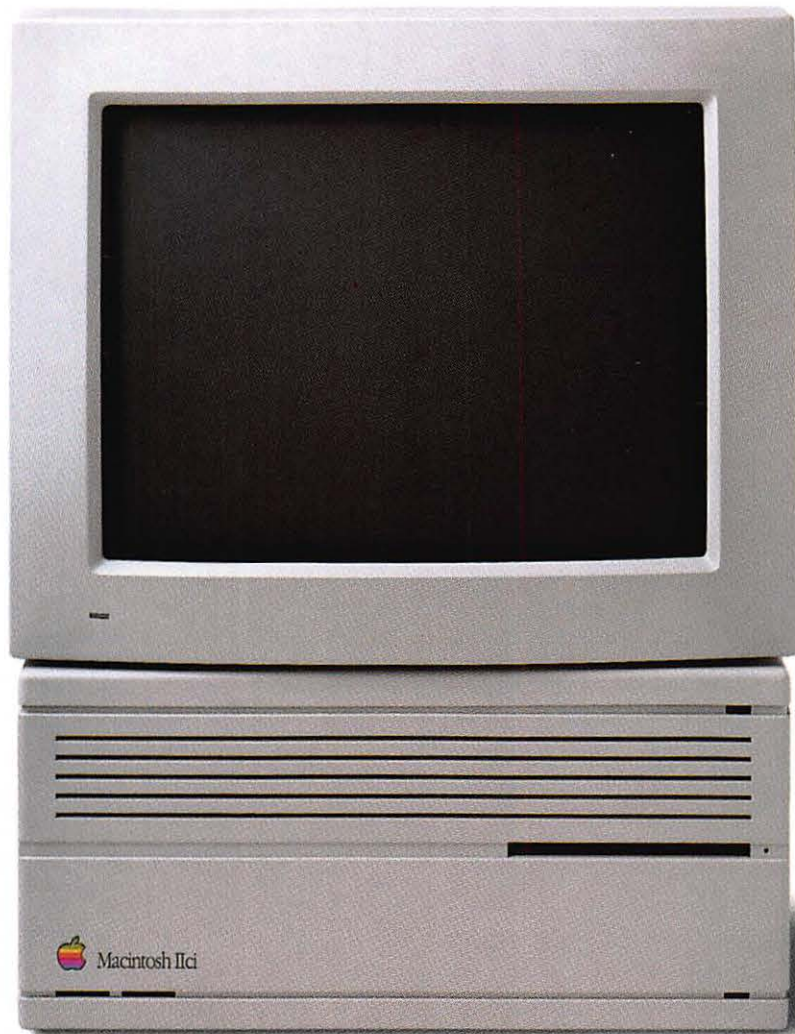
How to Set Up a Home Office

PROBLEMS YOU SHOULD AVOID



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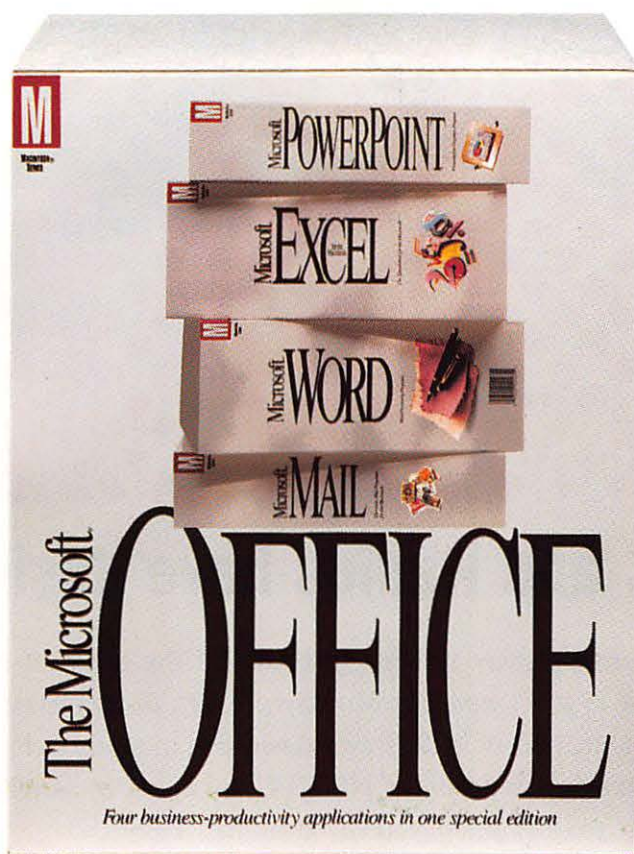
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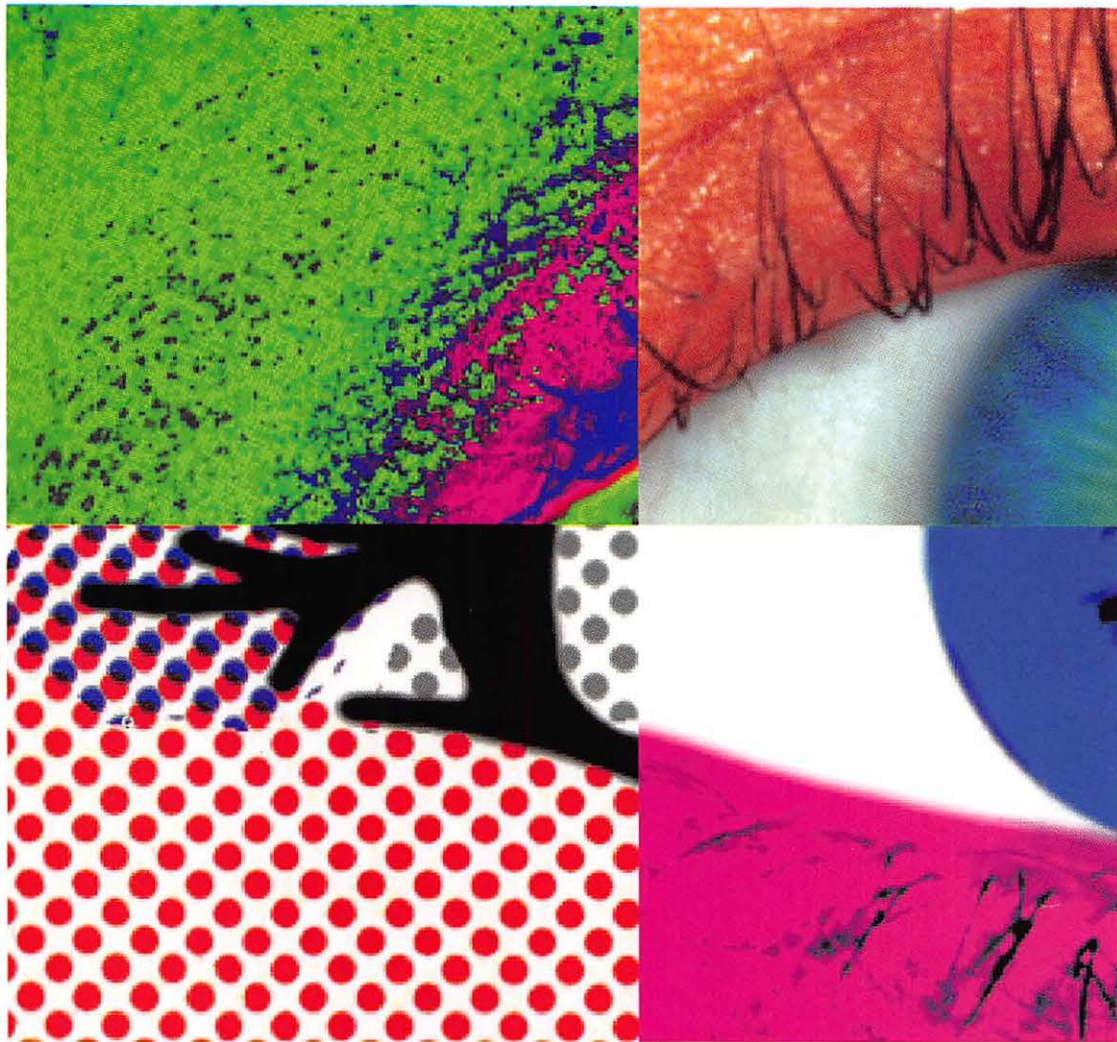
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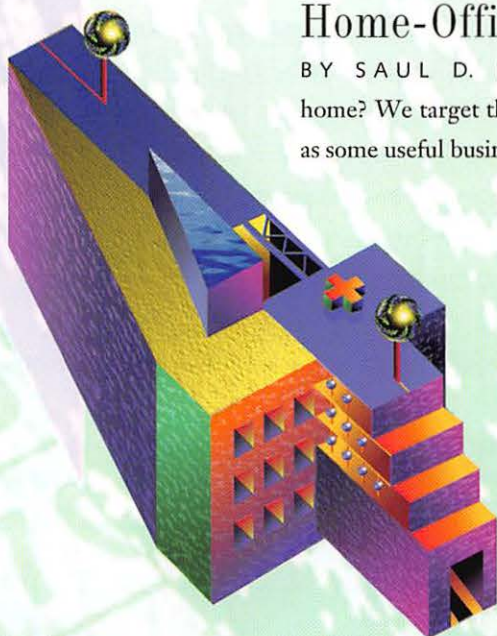
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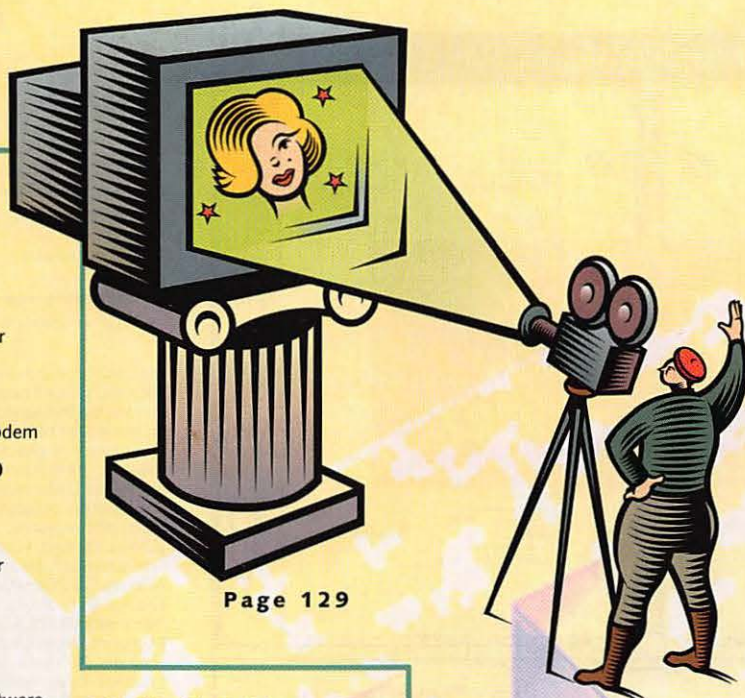
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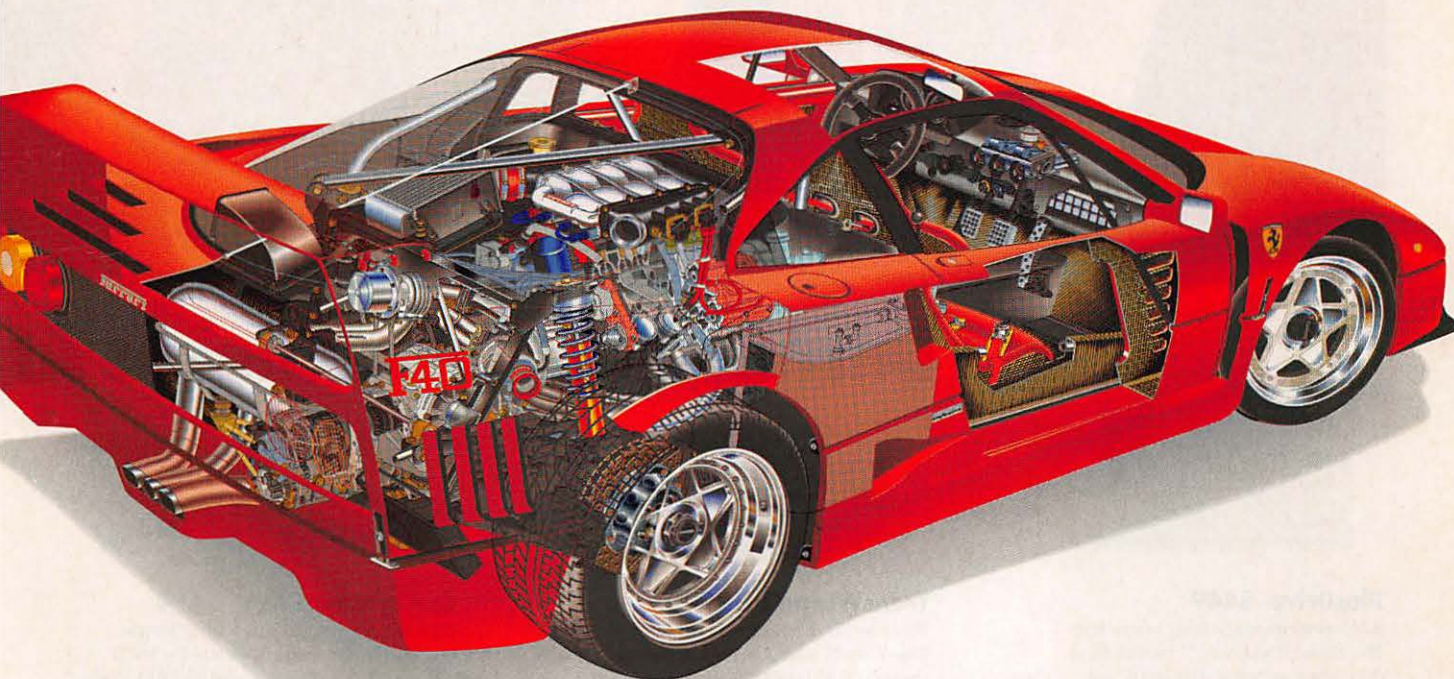
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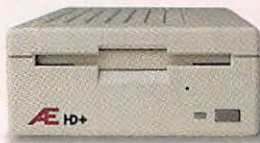
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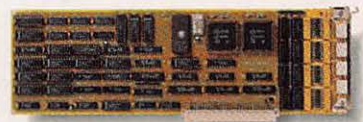
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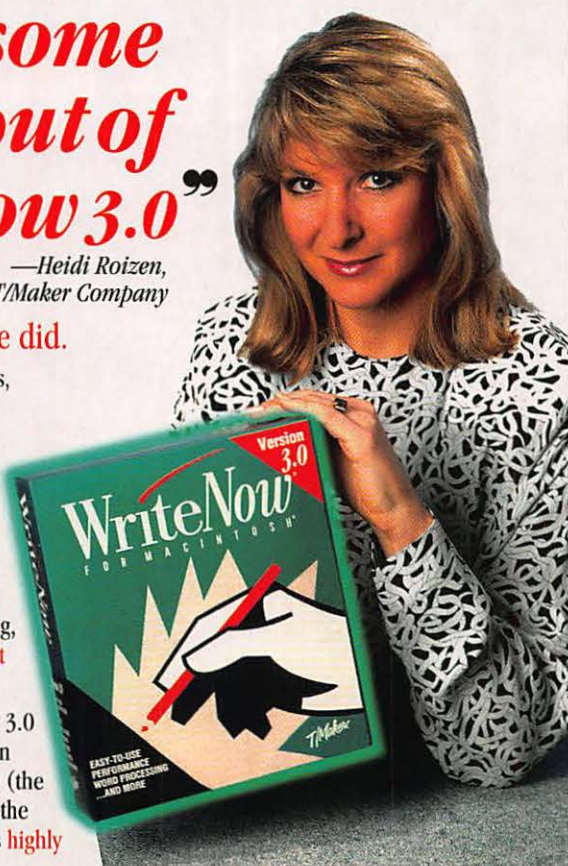
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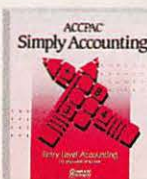
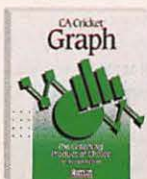
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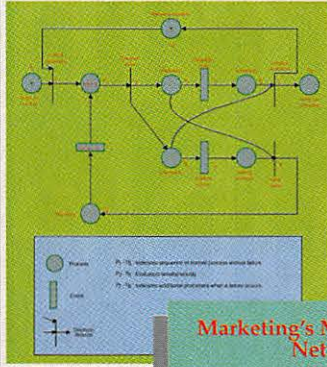
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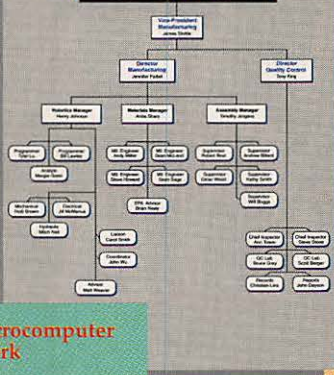
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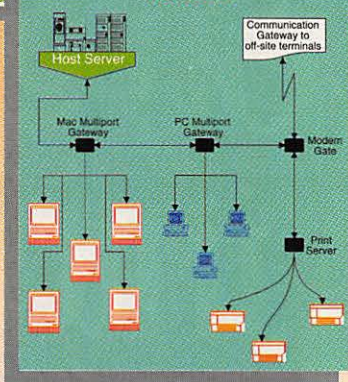
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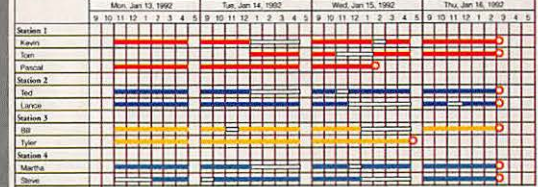
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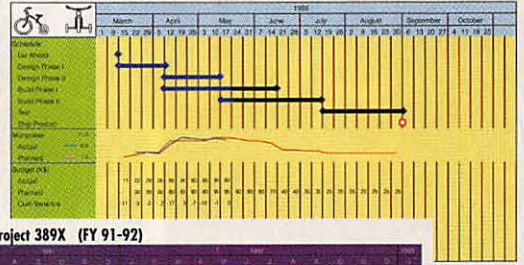
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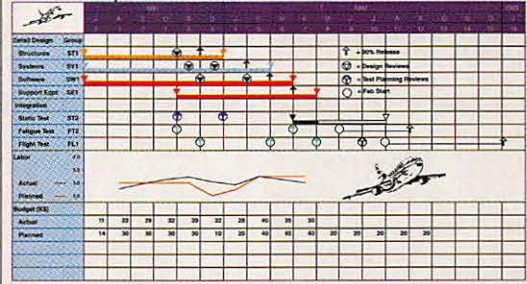
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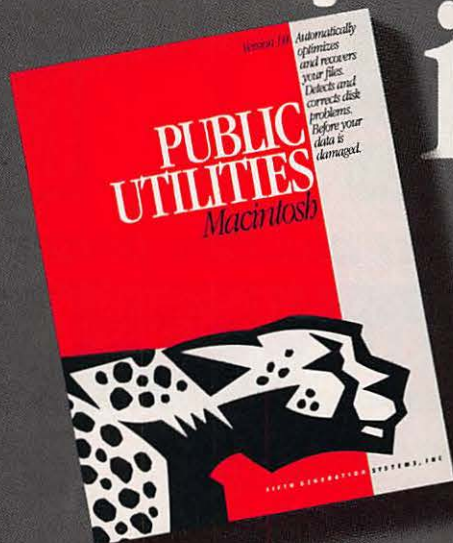
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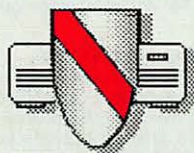
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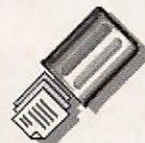
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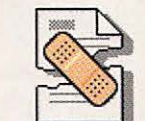
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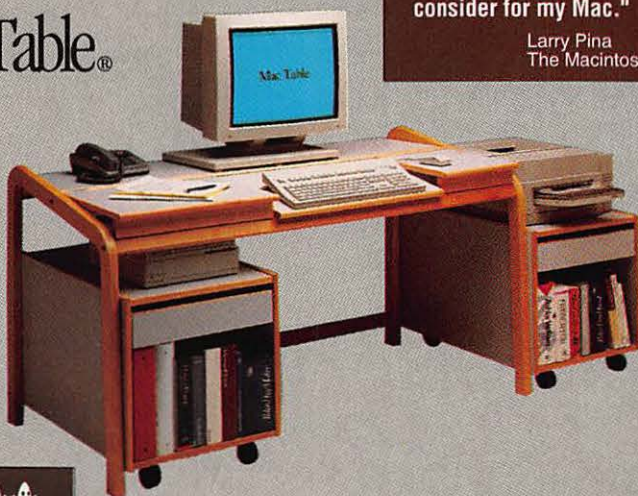


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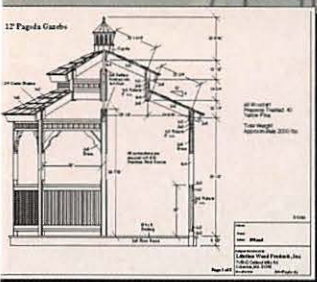


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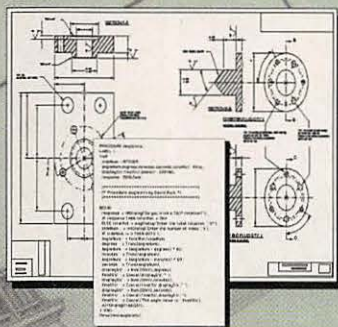
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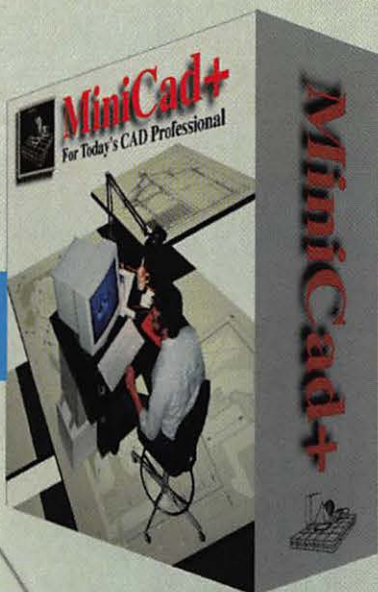
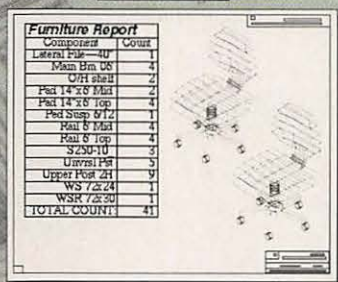
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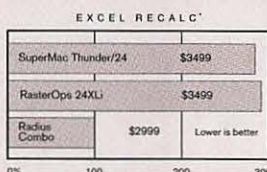
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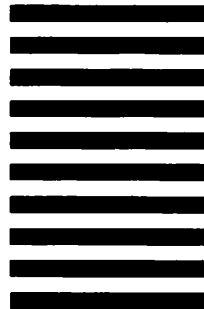
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LATE-BREAKING NEWS

Disappearing Folders Found: A problem with System 7 that sometimes causes folders to disappear is fixed in System 7 Tune-Up version 1.1, according to Apple.

Apple dropped prices by about 25 percent for the PowerBook 100 2/20 (with 2MB of RAM and a 20MB hard drive), to \$1499, and by about 8 percent for the PowerBook 100 4/40, to \$2199. Apple also cut the prices of the PowerBook 140 2/40 and PowerBook 140 4/40 by \$500, to \$2699 and \$2999, respectively. The company added these new models: the \$2999 PowerBook 140 2/80, the \$3299 PowerBook 140 4/80, the \$4299 PowerBook 170 2/80, the \$4299 PowerBook 170 4/40, and the \$4599 PowerBook 170 4/80.

Problems with early CorrectPrints caused RasterOps to send out PROM board upgrades to the color-calibrating printer. The first 100 or so CorrectPrint models lacked the promised JPEG compression, the company confirmed. RasterOps (408/562-4200) said the version 1.1 PROM fixes that and several other problems.

The Color Pivot/LE from Radius (408/434-1010) is a lower-cost version of the company's Color Pivot monitor, which swivels from portrait mode to landscape display. The Color Pivot/LE lists for \$1199 versus \$1549 for the Color Pivot, but the LE requires an adapter board while the original works with the built-in video on some Macs.

New tires and Macintoshes are now both available from some Sears stores. In a major move into consumer retail channels, Apple has authorized The Office Center at Sears to sell the

Macintosh Classic II, LC II, IIsi, and PowerBook 140, all bundled with an Apple modem and ClarisWorks.

Olduvai Revs OCR, MultiClip: Olduvai (305/665-4665) is upgrading Read-It Pro to 4.0, with batch processing capability, a multilingual spelling checker, and a window for suspected mistakes. It lists for \$595, including one spelling dictionary. An upgrade to the \$149 Clipboard enhancement MultiClip supports more applications (including Illustrator) and file formats (including EPS) and can add comments to clips and sort them.

Excel Analyzes Stocks: Spreadware (619/347-2365) is shipping Push-Button Market Analysis (PBMA). PBMA provides securities-analysis tools inside Excel 3.0 or 4.0, including stochastics, relative-strength charts, and candlestick charts. PBMA lists for \$99 and will increase to \$189 in July.

Bargain Word Processor: The second product in Softsync's (305/444-0080) sub-\$50 line is ExpertWriter (\$49.95), a RAM-conservative word processor that includes an address book and an envelope-printer utility that can do bar codes.

MacDraw Pro 1.5 from Claris (408/727-8227) adds support for tabs in text blocks; Apple events to control MacDraw from other applications; embedded QuickTime movies; and faster screen redraw. Its price remains \$399.

MapInfo's Data Access: MapInfo's (518/274-6000) ArcLink is a \$595 add-on to MapInfo that permits users to access data from Environmental Systems Research Institute's Arc/Info, use the data in MapInfo, and return modified data to the Arc/Info host. **m**



It'll remind you bought a Macintosh

When you take one look at this Lotus® spreadsheet, it will all come back to you.

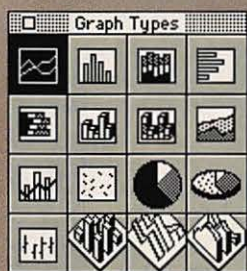
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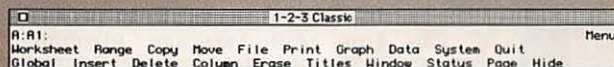
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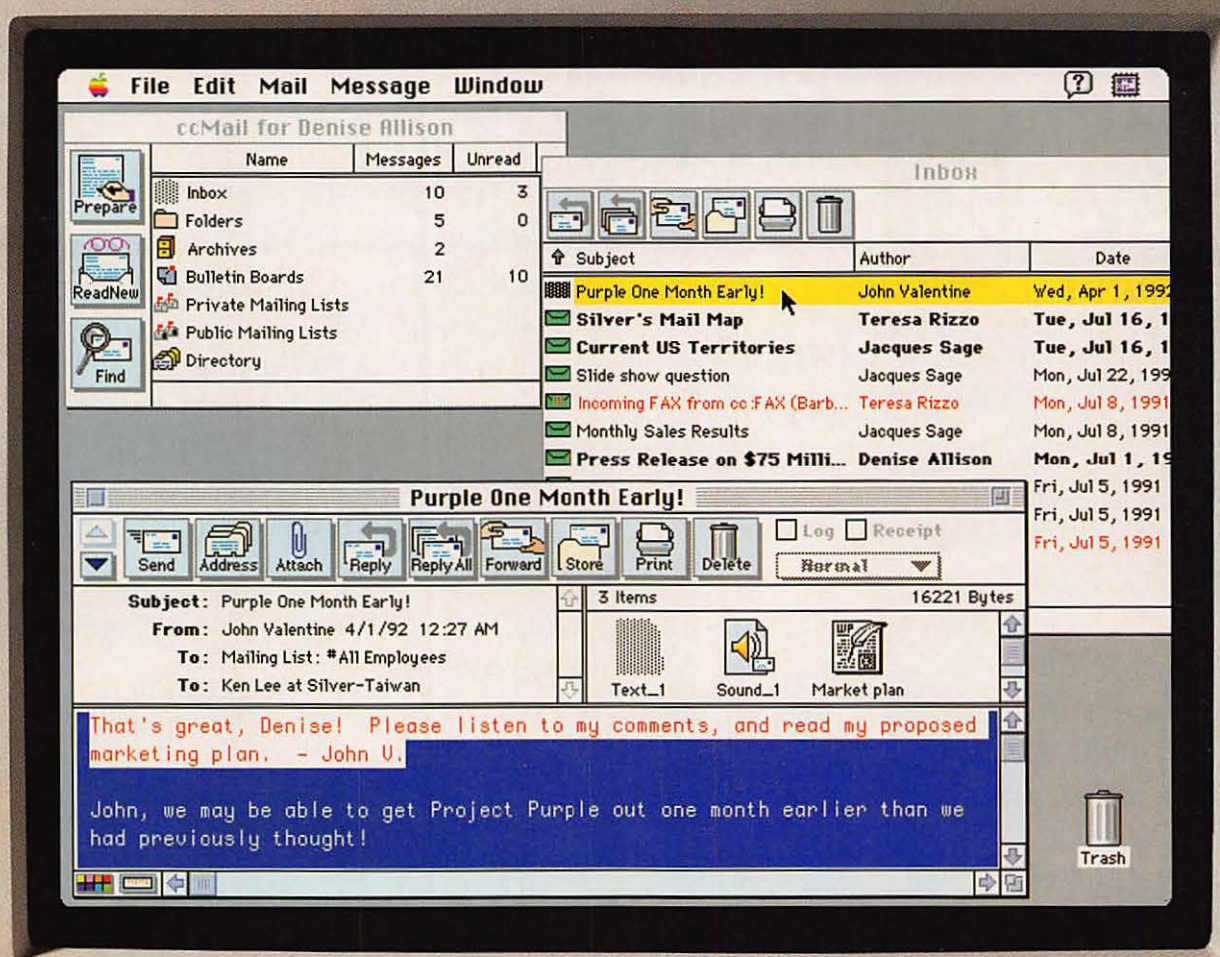
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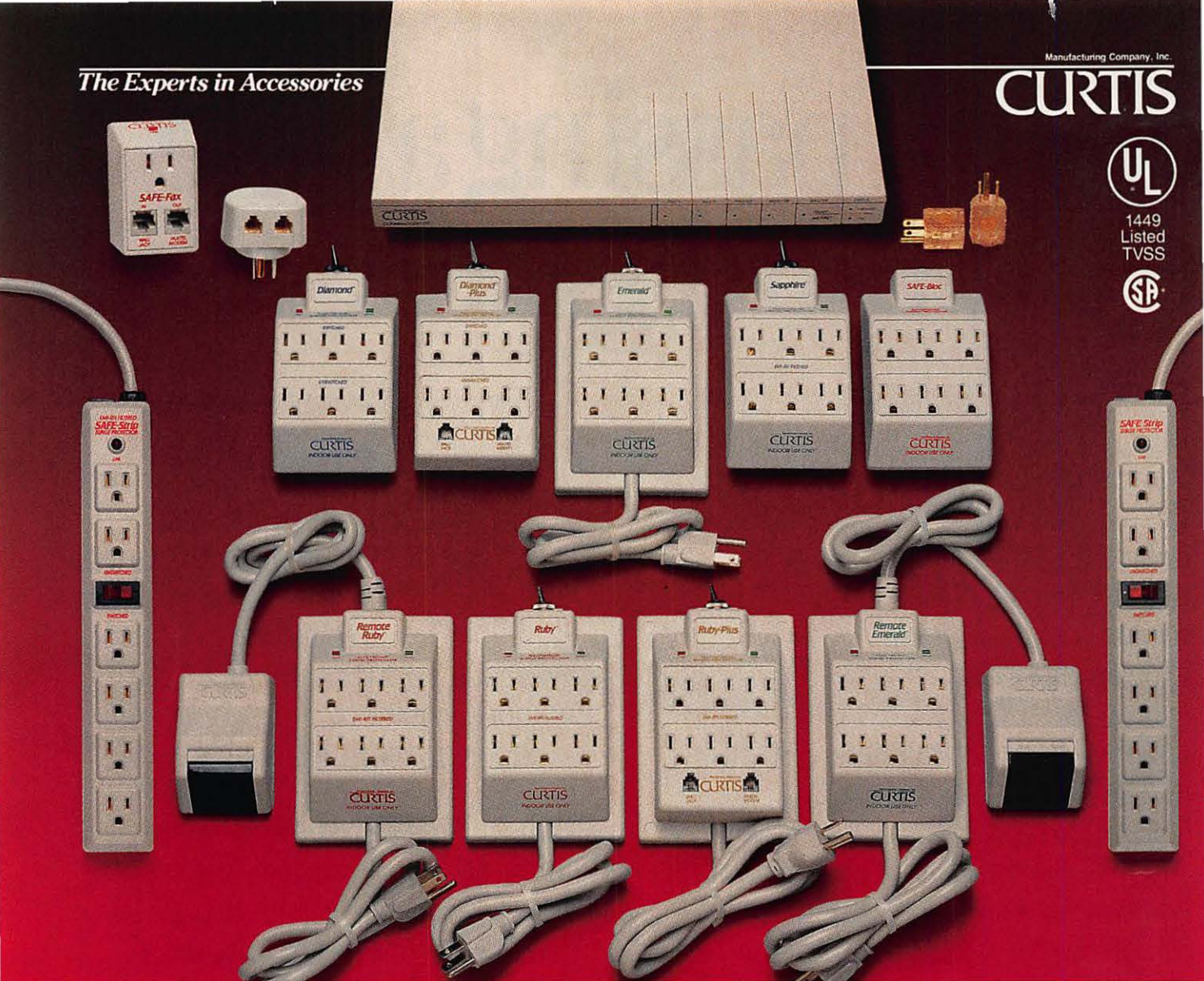
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Product Testing and Late Nights at the Lab: Part 1

BY JERRY BORRELL

IT'S A SCENE FROM *CASABLANCA*. We're in San Francisco. It's late. Mist is swirling outside the windows. All the guys wandering about the hallways need a shave. The corridors are dimly lit. Stacks of boxes and crates extend upward to the ceiling. The power just went out in part of our building, so racks of products are being moved elsewhere. On second thought, it's a little like a science fiction film. The workers are muttering about amps, and densitometers, and luminance. Did I mention it's late?

Mark Hurlow, Tim Warner, and Danny Lee of the lab are all looking the worse for wear. When I ask about the thick power cables snaking around the corridors, they respond to the effect that the circuit breakers, which are inaccessible after hours, were automatically thrown off when they plugged in one thing too many in addition to the 20-plus color monitors that they're in the process of testing. This in a building where we spent over \$50,000 for power-conditioning equipment. Huge racks of 19-inch displays are being wheeled around the offices toward power outlets. It's getting real late.

Third-World Wharves and Late Nights

WELCOME TO THE WORLD OF PRODUCT testing at a modern-day computer magazine. In 1991 we tested more than 850 products in the laboratory here at *Macworld*. Last year we averaged one feature article that included lab testing per issue. This year we're averaging two, but some issues have three because of Apple product announcements. In 1992 we're likely to test more than 1200 products. We believe in the testing that we do, that it's valuable to you in a market with thousands of products. (The numbers I am referring to here are the products covered in our feature articles. We also write single-product reviews, more single-product reviews than any other Mac publication. We're now beginning to add lab tests to those reviews.)

We produce two different lab-test-based features in each issue because we want to provide all of our readers with

something of interest in each issue. To accomplish that goal, we must cover a broader mix of features and reviews than one category would allow. And in the process of this coverage, the issues we confront are multiple and complex. Because *Macworld* is at a turning point in its lab testing, I am soliciting your viewpoint. In an upcoming issue we'll print a special section of your letters on the topic to reflect your opinions. Please read on, and then write in.

Why Do We Test Products?

THE PRIMARY QUESTION IS WHY *Macworld* should test products. *Macworld* was the first Mac magazine to run benchmarks on Mac products, beginning with the October 1985 article on hard drives. While we have consistently worked to better our product testing, we don't tend to market our results. Instead, we work behind the scenes to build our knowledge and to identify the best products for readers. And that is the reason why we have felt for the last seven years that we should be testing products: to help you by providing objective, timely information on what products you should buy. Computer magazines have hardly broken any ground on this issue; car magazines have been testing products for what, four decades? Stereo magazines and photography magazines also have a history of product testing. But what is the role of computer magazines in product testing? This is a question I hope you'll help us answer.

What Products Do We Test?

THE FIRST ISSUE IN TESTING is the decision about what products to test, and the scope of the products selected for testing. Software applications are most often evaluated outside the lab by our editors and authors, but that may change in the future. Hardware products are the primary focus of *Macworld* Lab, and they tend to fall naturally into several

product categories, with the Macintosh itself being the most obvious one. When a new computer is announced by Apple, you want to know whether it's in some way faster or better than its predecessor and whether it has revolutionary new features or is simply an evolutionary development. And especially whether a new Macintosh can run the software that you own without crashing.

Next on the list of products, in terms of reader interest, are the most-often-purchased peripherals for the Macintosh: hard drives, monitors, video boards, and printers. Other categories of hardware products have grown in importance over the years, including accelerators, networking products, fax modems, film recorders, and scanners.

As the Mac has matured, the originally narrow product areas have broadened and developed into subcategories that we believe are worth testing. Printers, for example, can be divided in several ways: by price (personal versus office/high-speed devices); by technology (laser, color thermal, ink-jet, and dye sublimation); and by performance categories (such as imagesetters).

The primary benefit of testing subcategories is that it allows *Macworld* to explore technology in greater depth. For example, we can focus on how new products in the color printer category (such as printers that use dye sublimation) or in optical media (such as CD ROM players or erasable optical drives) work. Subdivisions are useful to both the product-testing staff in the lab and to readers, who learn about technology, performance, and value.

How Do We Decide When to Test?

TO COVER THE LATEST product announcements, we sometimes schedule feature stories to coincide with major trade shows where many new products are announced. The editors also work with manu-

continues



*Can computer
magazines
deliver on what
they promise
readers?*

facturers to test the latest products for every lab feature. Typically we schedule lab testing for a feature six months to one year in advance.

Occasionally we push ahead or delay an article to coincide with the announcement of a new version of an important product or a technology several developers are implementing. We do it rarely, and then only in an attempt to serve the readers. But sometimes product developers attempt to use this to their best advantage. The worst problem with this is the delayed-product-shipment syndrome. Some developers prematurely announce a product to editors intentionally, in the hope of buying time until they can come up with a better product than a competitor. Others preannounce unintentionally; that is, their product development staffs have scheduled unrealistic shipment deadlines. In either case our staff, other developers, and readers suffer whenever products fail to ship on time.

In some product categories it makes sense to schedule an article when a new technology becomes available from several vendors. Hard drives are a good example. At roughly the same time, new generations of technology (higher-capacity mechanisms in smaller form factors) are made available to Macintosh develop-

ers who then release new product families based on the new technology. So it is sometimes sensible to wait for such a category to arrive so we can test a full range of products.

Who Should Do the Testing?

IDEALLY THERE WOULD BE THIRD parties out there who would test computer products, and computer magazines could focus on issues other than processing hundreds of products through quality testing. Several years ago both Apple and *Macworld* worked with another independent testing group, the National Software Testing Lab, in an effort to push NSTL toward producing regular product tests. Over the past two years NSTL has, in fact, produced more tests of Macintosh products than in the past, but still far too few. And its results, because of the high cost of testing, are typically sold to corporations rather than published in magazines.

Over the last five years *Macworld* has slowly built a staff and facilities for testing products, following in the footsteps of many other magazines on the DOS side. But the conundrum remains. What should a computer magazine be responsible for? How much testing should be done? What products should be tested? What kinds of

tests should be performed? How should the results of tests be represented? What tests yield results that are valid or useful to the reader?

Are Car Magazines a Role Model?

THE EXAMPLES THAT WE MOST OFTEN hear about from developers are the car magazines. An estimated 200 new car models are introduced into the U.S. market every year (not counting trucks or specialized vehicles). Compare that with the 850-odd products we tested last year. We often wonder aloud how to perform the kind of long-term testing that seems so valuable in car magazines. You know—drive an automobile for a year, keep a record of all service and repair, retest it after running it for 20,000 miles and see how it stands up. For cars costing \$10,000 to \$20,000, that's really worthwhile. But how does that relate to a product category such as hard drives—a category in which \$1500 is a high price and in which there are hundreds of products to test. A category in which the products tested now are replaced by a new generation of products in 12 to 18 months.

Moreover, car tests are relatively straightforward and unchanging, made up of acceleration, braking distance, fuel

continues

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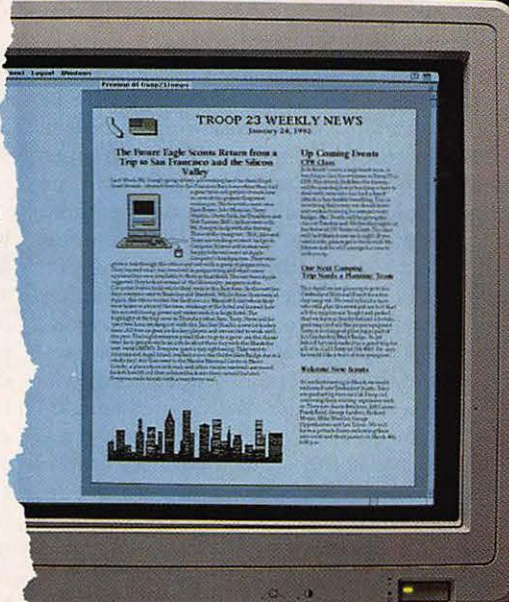
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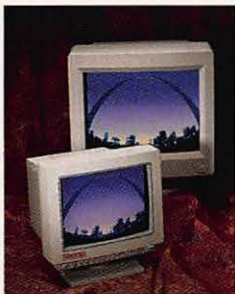
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economy, and heaps of statistics. OK, we can add the list of testing done by *Consumer Reports*: starting/running, transmission, routine handling, emergency braking, ride, noise, driving position, and so on. Maybe it's not so simple. But these tests apply year after year, and all the cars have brakes, engines, and other features that don't vary in terms of their technology—at least not relative to the breadth of technology that *Macworld* must understand and test. We may jump from covering complex networking technology to hard drive heads to print mechanisms over a one-month period.

Then there are the practical problems. How could we keep the several hundred drives we tested last year running throughout the year? We would have to build a separate facility. We would have to implement test suites to simulate normal use over a long period of time. Information already provided by most drive manufacturers in their MTBF (mean time between failure) statistics. Drive technology is changing so quickly that by the time we published the results of our year-long tests, some products would no longer be on the market. And you probably wouldn't want to buy them anyway because newer drives with better performance for less money would be available.

As much as we would like to do long-term testing, we simply can't justify it for our market of fast-changing hard drives, most of which cost under \$1000. And that's only one product category. How about long-term testing of, say, scanners? Opening and closing a lid, running a scan. Or printing to test duty cycles. And of course we would have to purchase all these products so we could keep them for long periods of time, something not even vaguely possible in the economic model of publishing that we operate under. So we don't run long-term tests.

Why Do We Collect Feature Information?

WE COLLECT AND PUBLISH SPECIFICATION information about products. In the past, we, like other computer magazines, have sometimes been guilty of overemphasizing less-important aspects of hardware and software. Describing the sizes of hard drives cases, for example. On the one hand, some corporate buyers use the feature charts that we publish to determine whether a product meets with their purchase requirements. On the other hand, producing charts tends to force developers with no tick mark in certain categories to add those features—expending precious resources developing features they may

not believe are useful to their customers. Still, some of you would be angry if you could not find a succinct table of desktop publishing software features so you could compare two products you are considering for purchase. At the same time, we recognize that more features do not necessarily equate with better products.

We are attempting to de-emphasize the measurement/feature charts and to more heavily emphasize issues such as warranty, technical support, and price for value, in an effort to reward developers who stick with their products once they leave dealers' or mail-order vendors' shelves. So we have dropped the case measurements from hard drive feature charts, but have kept sound measurements and performance tests. And we've begun to more assiduously collect information about tech support, upgrades, and warranties. We're attempting to replace the vast feature charts with narrative summaries of products' strengths, and with recommendations for what products are appropriate for which applications or users.

So What Do You Think?

WRITE IN. ARE WE HEADED IN THE right direction? Let us know your thoughts. And please tune in next month for Part 2. **m**

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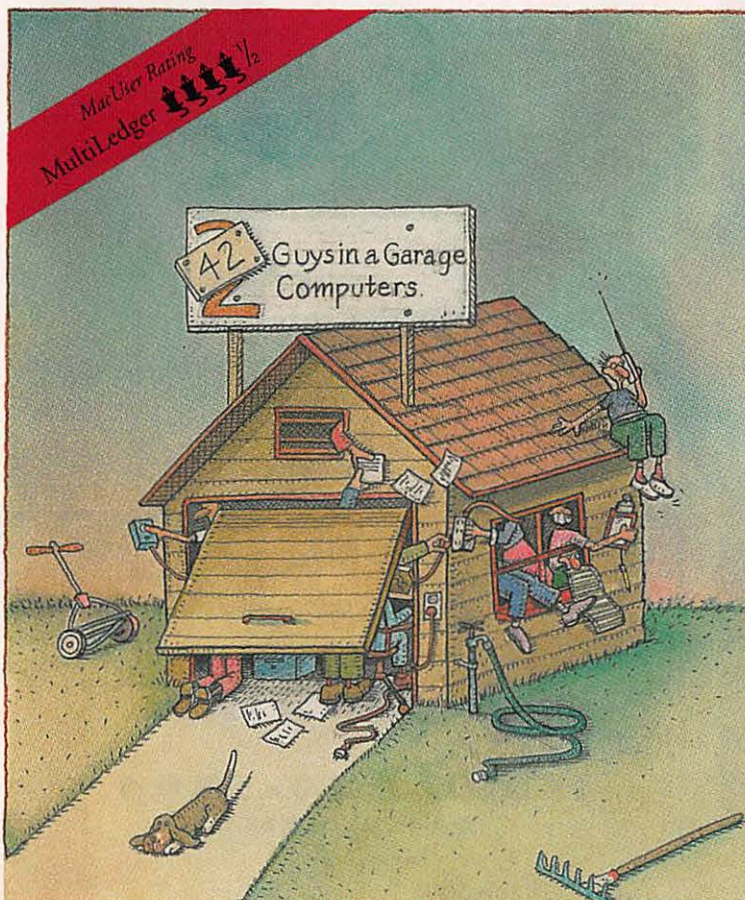
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As a Quantum Company, La Cie offers customers the advantages of \$489 million in assets. Deep-pockets R&D. State-of-the-art technology. Superior value. And, the assurance of long-term support. Yet for all our size, La Cie's smallest achievements still make our biggest headlines.

Introducing the PocketDrive.™ Portability in the palm of your hand.

Pack it in your pocket, purse or briefcase. La Cie's new 40MB and 80MB power-packed PocketDrives offer ounces of convenience,

La Cie 40MB PocketDrive

\$499

not pounds. Using Quantum's new 2 1/2" drive, the PocketDrive offers 19ms seek time, whisper-quiet operation and La Cie's exclusive switchable termination and SCSI ID.

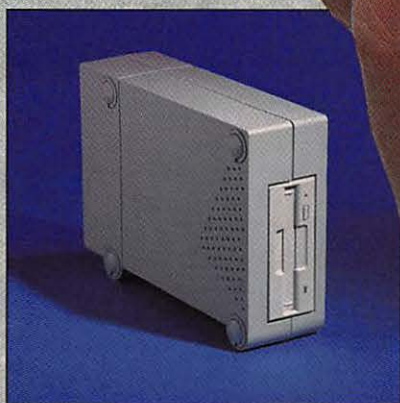
Desktop docking.

La Cie's PocketDrive eliminates the hassle of fumbling with cables at the back of your Macintosh every time you connect or disconnect the drive. Instead, the PocketDrive comes with a unique PocketDock™ desktop docking cable that lets you plug in the PocketDrive in seconds. With a second PocketDock (only \$99), you can have fast and easy connection at work and at home. There's even a miniature T-connector (only \$59) for connecting to other Macintosh systems.

Pocket Silverlining and an extendible 2-Year warranty.

Every PocketDrive comes complete with one PocketDock, our award-winning Silverlining hard disk management software and our extendible 2-Year Limited Warranty. For only \$1 per MB, you can enjoy 72-hour warranty service for up to 5 years.

of our size.



La Cie Cirrus Optical Drive



Set your sites on a Cirrus Optical™ magneto optical drive.

Introducing Cirrus Optical. La Cie's remarkable new 3 1/2" magneto optical drive that offers massive storage capacity, superb reliability and high-speed performance in a compact case.

Space consciousness.

Smaller, faster and less expensive than conventional optical drives, La Cie's Cirrus Optical uses cartridges that are the same size as 3.5" floppies, but store eighty-eight times more data than high-density floppy disks. Engineered to fit within our space-saving, award-

winning Cirrus case, the Cirrus Optical offers the reliability of optical media, 45ms seek times and the economy of removable cartridges.

La Cie Cirrus Optical Drive

\$1699
with cartridge

Lose Weight. Lose Wait.

Until now, optical technology had a reputation for being slow. Cirrus Optical drives at 45ms are faster than the conventional opticals. La Cie's Cirrus Optical leaves the others in the dust.

Try one on for size.

When you need major-league performance in a pint-sized package, call us. We offer surprisingly small prices and a huge commitment to service and support.

"I'm now taking the safer course of buying from corporate-owned companies such as Quantum-backed La Cie..."
MacWeek

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La Cie DAT Drive

La Cie ExpressDrive



La Cie Tsunami

The drive to satisfy.

At La Cie customer satisfaction is the driving force behind everything we do. From our innovative product design to our capable, courteous customer support, La Cie goes the extra mile to assure you quality, service and value.

La Cie award winning chassis. Quantum power under the hood.

Sleek. Streamlined. Easy handling. Economical. La Cie drives deliver the advantages of award-winning design and state-of-the-art technology. Inside and out. For high-speed performance you can depend on, all La Cie hard drives up to 400MB incorporate the world's most respected and most trusted drive mechanisms—Quantum!

La Cie hard drives from
\$239

Internals. Space savers. Portables.

La Cie offers customers a complete line of hard disk drives featuring state-of-the-art components, whisper-quiet half-speed fans, access times as low as 15ms, wide-range power supplies and La Cie's exclusive switchable termination and SCSI ID.

- 50MB-1.6GB Internal
- 50MB-1.6GB ZFP
- 50MB-400MB Cirrus
- 50MB-400MB Tsunami
- 50MB & 100MB Bacster™
- 40MB & 80MB PocketDrive

Drive the La Cie Express.™

We love all our drives, but take a look at our newest arrival.

La Cie's new ExpressDrive!™ Perfect for sensitive installations, the ExpressDrive is empowered with the performance of a Quantum fixed drive and the security and convenience of a removable drive, yet none of the risks of open-air media.

ExpressDrive from
\$Call

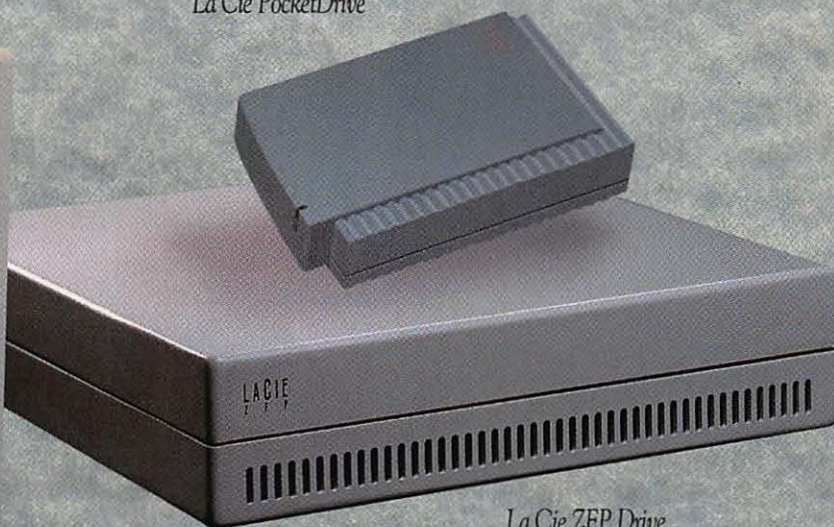
of our drive.

La Cie Cirrus



La Cie Cirrus Optical Drive

La Cie PocketDrive



La Cie ZFP Drive

Readable. Writable. Removable.

Economical, versatile, ideal for archival backup, La Cie's comprehensive line of removable media options includes:

- Removable cartridge drives
- ExpressDrive
- 3 1/2" & 5 1/4" magneto opticals
- CD ROM

Every drive has a Silverlining.

Acclaimed the most powerful hard disk manager available, La Cie's Silverlining is included free with every hard drive!

Tape backup with Retrospect.

Tape drives from

\$649

Tucked neatly inside our Cirrus case, La Cie's 155MB or 600MB tape drives and 1.2GB or 2.0 GB DAT drives come with Retrospect software offering easy, economical data protection.

Up to 5-year warranty.

Ask about our generous warranties. La Cie offers up to a 5-Year Limited Warranty on Quantum drives and a speedy 72 hour turn-around on all warranty service!

Ready for a drive.

Don't let the quest for the right mass storage solution drive you wild. Call us. Our friendly, highly qualified staff will gladly help you select the perfect device to suit your needs and budget.

"Silverlining has bailed me out of so many tough situations, I've lost count."
Bobker's Dozen Best, MacUser, December, 1990

"La Cie hard disks are the most reliable and convenient disks I've ever had..."
James J. Haf, Lansing, MI

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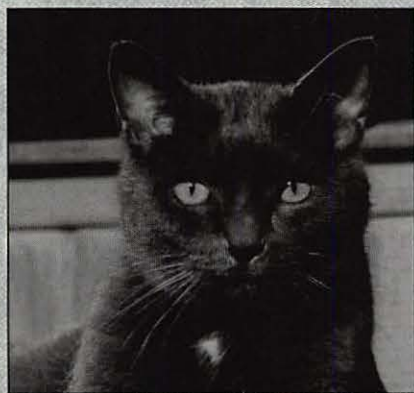
Microtek 600ZS

\$2,195*



Howtek Scanmaster 3

\$8195**



La Cie Silverscanner

\$1,399



Microtek 600ZS
300 dpi at 1600%



Howtek Scanmaster 3
300 dpi at 1600%



La Cie Silverscanner
300 dpi at 1600%



Microtek 600ZS
600 dpi at 800%



Howtek Scanmaster 3
400 dpi at 1200%



La Cie Silverscanner
600 dpi at 800%

Image is everything.

We believe quality is a priority. Our image as a company that produces quality products is well known. We're so confident in the quality of our scanner image that we are willing to compare it to other scanners right here. Compare for yourself.

Great color the first time.

Just look at the difference in the color scans. The single-pass Silverscanner has three separate noble gas-filled lamps for red, blue and green that are balanced so you get great scans the first time. With Silverscanner's built-in gamma correction, you get clean, bright scans with excellent detail in those hard-to-get areas that don't require difficult adjustment like other scanners. This can mean substantial time savings when every second counts.

The shadow knows.

Do you want good shadow detail? Then compare the black and white scans. The Silverscanner can give you production quality gray-scale scans for magazines, newspapers and brochures.

Lay it on the line.

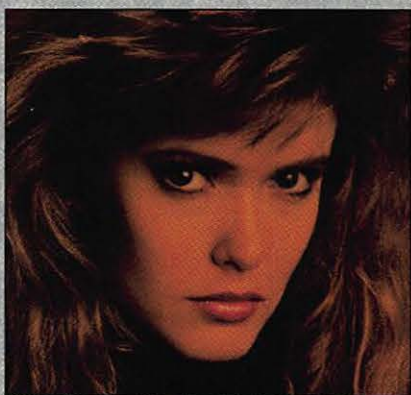
When comparing line art, the Silverscanner really shines! At 1200 dpi you get what amounts to an *electronic stat*. The comparison is incomplete, however, because some scanners don't have hi-res capability (too bad). But even if you compare at 400 or 600 dpi, it's clear how much better the Silverscanner is, especially bundled with Color It!

La Cie Silverscanner with Color It

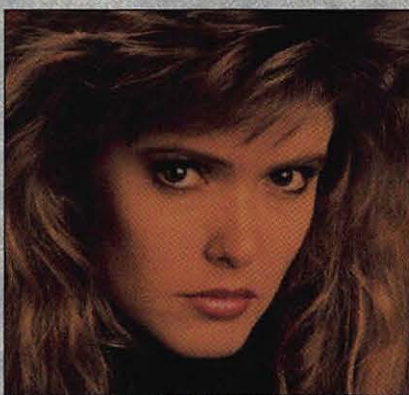
\$1399

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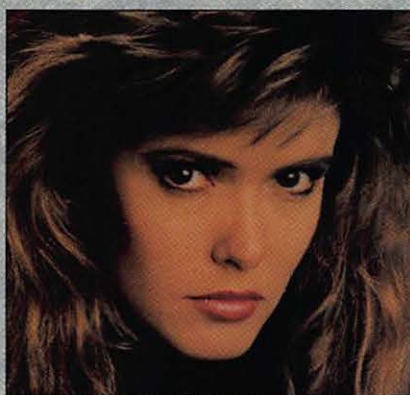
of our image.



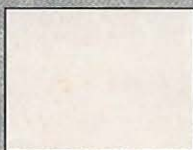
Microtek 600ZS



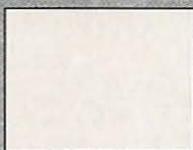
\$2,195* Howtek Scanmaster 3



\$8195** La Cie Silverscanner \$1,399



Microtek 600ZS
1200 dpi at 400%—n/a



Howtek Scanmaster 3
1200 dpi at 400%—n/a



La Cie Silverscanner
1200 dpi at 400%

All scans were done at default settings with no corrections. The color images were separated using Adobe Photoshop. The logo was scanned as grayscale and as line art. This entire ad was done on the Macintosh using Silverscanner, Photoshop, Quark XPress and a PostScript Imagesetter. The entire production cost was \$145.



La Cie Silverscanner
1200 dpi at 100%



Software to die for!

We're proud of our image when it comes to quality software, too. La Cie has always had a reputation for powerful, well-written software. La Cie's exclusive plug-in modules for Photoshop, ColorStudio, Digital Darkroom, Enhance, ImageStudio and RagTime have been hailed as some of the best software ever written for flat-bed scanners. Enjoy features like fast dynamic *color* previews, independent color/brightness controls, nine scan modes, savable scan settings, color dropout, magnified previews, proof scans, 25% to 400% scaling in 1% steps, and 25 dpi to 1200 dpi in 1 dpi steps.

Silverscanner is OCR and Apple System 7 compatible and can be purchased with full versions of Adobe Photoshop *and* Fractal Design's ColorStudio—a \$2139 value for only \$1899!

La Cie Silverscanner with
Photoshop and ColorStudio

\$1899

Who ya gonna call?

La Cie offers you toll-free expert technical support. We know scanning inside and out. We can help you. And we'll be here for you tomorrow because La Cie is a Quantum Company.

Seeing is believing.

La Cie is so proud of the Silverscanner, we used it to produce this ad. Not just the comparisons, *everything*. Call and order yours today.

"The choice is clear . . . buy the La Cie Silverscanner."
Macworld, June 1991

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We're proud of our value.

50MB Quantum ~~\$299~~ **\$239***

50MB.....	\$239	\$299 Int.	\$319	\$239 Ext.	155MB Tape Drive.....	\$649
100MB.....	\$399	\$429 Int.	\$479	Ext.	600MB Tape Drive.....	\$999 \$1199
120MB.....	\$479	\$529 Int.	\$559	\$579 Ext.	1.2-2.0GB DAT Drive.....	\$1499 \$1799
240MB.....	\$769	Int.	\$849	Ext.	128MB Cirrus Optical.....	\$1699
400MB.....	\$1299	\$1399 Int.	\$1399	\$1499 Ext.	ExpressDrive.....	\$Call
1.2GB.....	\$2009	\$2749 Int.	\$2099	\$2899 Ext.	Silverscanner	\$1399
80MB PocketDrive.....	\$649				Silverlining	\$149

Call for products not listed.

You'll be delighted at La Cie's competitive prices. Especially when you consider what you get absolutely free. Like our acclaimed Silverlining software. Five megabytes of public domain software. A 2-Year Limited Warranty on Quantum mechanisms (extendible to 5 years). 72-hour turn-around on warranty service. Prompt, courteous, competent service.

At La Cie, we take pride in the unsurpassed value we offer customers. From our state-of-the-art technology to our award-winning design, La Cie never stops working to bring you better products and services than ever before. And because we're a Quantum Company, you can be assured La Cie will continue to provide you service and support for years to come.

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International 503-520-9000 Fax 503-520-9100

*Prices subject to change. Please call for lowest current prices and volume discounts.

Letters

JULY 1992

Mac Spirituality

NEW AGE SOFTWARE SOUNDS GREAT (*The Iconoclast*, April 1992). One of the biggest problems with the personal computer is that, generally, only one person at a time can use a terminal. Now, with the right program, you can gather a group of friends and use the mouse with an on-screen Ouija board. Great fun at parties.

Can you channel your spirit guide with a modem? Be sure to wear the right crystal to reduce ELF emissions, and just think of the revolutionary virus-protection software.

*Turner Babcock
Berkeley, California*

IHAVE ENJOYED READING MANY COLUMNS, particularly *The Iconoclast*. I enjoy Steven Levy's humor, cogency, and the information he imparts. Alas, in his latest piece, I also detect an extended sneer. Yes, the software is of variable quality, and I would concede that it is easy to mock anyone involved in a spiritual quest. Also, since we are talking about small businesses, run by entrepreneurs taking great risks, I think a more creative response would be to encourage more development, not the opposite.

*Tim Turner
Portland, Oregon*

IT'S TOO BAD "SENSITIVE NEW AGE Software" was written by such an insensitive critic. Mr. Levy's primary interest seems to be in unburdening himself of his personal prejudices regarding astrology and other self-help information.

*Julia Lipton Skalka
Springfield, Virginia*

Crossing Bridges

AS A PC USER AND RESELLER, I was prompted by your article "Bridging Two Worlds" (March 1992) to

bring in a copy of Mac-In-DOS, only to find that it didn't have anything to do with Mac-to-PC file transfer. This prompted further research with these results.

Pacific Micro's Mac-In-DOS is strictly a DOS shell program that gives the user a Mac-like environment.

PLI's Mac-to-DOS does allow a PC user to read and write to a Macintosh floppy via the PC's 1.44MB floppy drive.

MacLinkPlus/PC allows a PC user to read and transfer Mac files via a direct-connect cable method or via a modem. It does not allow a PC to read and/or write to a Mac floppy in the PC's 1.44MB drive. It will, however, allow the Mac to read and write to DOS floppies via a DOS mounter.

Central Point Deluxe Option Board, which you didn't mention, is an add-in board that allows a PC to read and/or write to 800K floppies in a Toshiba or Teac floppy drive. It will also act as a jumperless 1MB controller board for a tape backup unit. My informal tests, however, indicated a 50 percent failure rate on file transfers and 100 percent failure on complete Mac-to-Mac disk copy.

For the PC user who is looking for an inexpensive way to transfer files from a Mac to a PC via floppy disk, Mac-to-DOS appears to be the product of choice.

*Dennis Staysniak
Lorain, Ohio*

Sightly Column

IENJOYED YOUR ARTICLE ON VISION problems with computer use (*Conspicuous Consumer*, April 1992). I am in my forties and have bifocals, which aren't so humiliating if you want to see very close or far away. My constant head-bobbing when looking at computer screens drove me nuts. I was getting eyestrain and using the top vision part of the glasses far more than I should have been.

My eye doctor suggested having a pair

continues

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...the Innovators in Power & Performance for Macintosh computers.



Macintosh Powerbook™ Memory Modules

Add 2MB, 4MB or 6MB to get a full 8MB of total RAM in all Powerbook models 100, 140 or 170.



NEW Macintosh Classic™ II FPU-882 Card

FPU-882 Math coprocessor card handles most applications from 2 to 5 times faster.



NEW Low-Profile 16MB SIMMs for the Macintosh Quadra™ 700 & 900

Newer's specially designed low-profile 16MB SIMMs offer up to 68MB in the Quadra 700 and up to 256MB in the Quadra 900.

Use up to 1024MB of application memory with MacSWELL™ INIT

Only Newer Technology offers this System 7 application memory solution. MacSWELL modifies the standard GET INFO box. Bundled exclusively with all of our 16MB SIMMs.

Ask about

- SCSI II Dart ultra-high-speed RAM Drive.
- Complete line of 4MB, 8MB and 16MB SIMMs.
- fx/Overdrive and Quadra/Overdrive accelerators.
- Ask about our 16MB SIMMs for other Macs.

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Circle 146 on reader service card.



Audioshop™ is the hot new software for playing, recording and editing your Macintosh audio. Change Mac System sounds, add audio to HyperCard, record your voice and add special effects so your voice sounds like an alien! Color graphics and powerful editing tools make sound a blast (or an elephant, or any sound).

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THE
MAC**

- 2 Free Disks of Sounds -

You get 2 free disks of sound effects and music to start exploring sound right away. Also, you don't need a CD ROM drive to use Audioshop but it's even more fun if you have one.

Songs from your audio CD collection and digitized sounds can be assembled into a "playlist." Change the order they're played by simply clicking and dragging.



- ▼ Create fun messages for your answering machine
- ▼ Cut and paste sound waves like text in a word processor
- ▼ Edit voice annotations for QuickTime supported applications and E-mail
- ▼ Add soundtracks to your QuickTime movies, and Director presentations
- ▼ Record songs and greetings to send to friends

Audio formats supported include QuickTime, AIFF, HyperCard, Director, and SND. Record audio using the microphone included with your Mac or any compatible input device, a perfect choice for Mac II LC and PowerBook users.

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415-369-8131

Trademark: Audioshop, Opcode Systems, Inc.; Macintosh, HyperCard, QuickTime, Apple Computer, Inc.; Director, Macromedia

End users circle 280 on reader service card
Dealers circle 285 on reader service card

of glasses made with one lens that focuses at arm's length, the proper distance from the screen. My computer glasses have stabilized my vision problems.

Thomas Gasparotti
Capitola, California

THERE IS NO EVIDENCE THAT COMPUTER use can accelerate the development of eye-focusing problems. Computer use cannot make you nearsighted,

eye exercises cannot improve your visual skills, and the notion that "some vision specialists don't understand or accept the impact long-term computer use can have on eyesight" cannot substitute for the lack of scientific proof of the assertions made in the article. Had the author consulted the American Academy of Ophthalmology, she would have found out that there is no evidence of any harm to the human eye from computer use.

Jeffrey Tennant
Alsip, Illinois

CORRECTIONS

The correct toll-free number for Prime Option is 800/828-9877 (Where to Buy, April 1992). The correct number for the LLB Company is 206/454-7302; for Dayna Communications is 801/531-0600; and for Memory Direct is 714/848-5408 (Where to Buy, May 1992). The correct number for Xerox Imaging Systems GS plus upgrade information is 800/248-6550 (Letters, May 1992); for Microsoft is 206/882-8080 (News, May 1992). The correct numbers for PLI are 510/657-2211, fax 510/683-9713 (New Products, April 1992).

Advanced Micro Devices makes the Am29005 chip used in the Apple Personal LaserWriter NTR ("More for Less: An Updated LC and LaserWriter Duo," May 1992).

"How to Keep Your Mac Current," May 1992: Using eight 1-megabit RAM chips results in 1MB of memory, not 8MB. A #16 Torx screwdriver should be used to open a compact Mac. The LC II is limited to 10MB of RAM because of its memory controller chip. On a 19-inch monitor, the Quadra 900 with 2MB of VRAM can display only 8-bit color. The Plus and SE diagrams for configuring memory are reversed. The RAM banks for the SE are horizontal, not vertical. Bank A and Bank B SIMM descriptions for the Plus should be reversed. Bank A on the IIfx is closest to the power supply. The banks on a Quadra 900 are arranged horizontally in slots of two rows each. In the "Memory Limits by Mac Model" sidebar, the model listed between the IIfx and IIfx should have been the Mac IIfx.

The times listed for 1K file-transfer times in "Moving Up to Ethernet," May 1992, are correct; the bars are not drawn to scale.

Microtech's repair-turnaround time is two days, and the company provides online support on the company's BBS. Microtech sells through dealers. Microtech's Nova drive line does not provide password protection ("High-Capacity Hard Drives," May 1992).

We used a DayStar RAM PowerCard, which creates a nonvolatile RAM disk, for our low-level tests (Lab Notes, May 1992).

The correct price for ComStation 2 is \$399. The correct price for ComStation 4 is \$499. (Reviews, June 1992).

The SuprafaxModem V.32bis is from Supra Corporation (News, May 1992).

Not a Whiner

THE WORLD OF MACINTOSH USERS is a bunch of whining wimps, to the point where I'm almost ashamed to say that I am a devout Macintosh user.

Apple continues to upgrade its wares, far beyond the technology of other computer companies in the same area. So users whine that their previously purchased Macs are becoming obsolete. Would they rather Apple do what other computer companies do—not try to go where no computer user has gone before?

Whine, whine, whine. David Binion's whine in the April issue (Letters) is petty. Whether the switch on a piece of computer equipment is easy or difficult to reach, the equipment should be plugged into a remote switch, and the remote switch used to turn it on and off. Switches are electromechanical devices and eventually wear out. It does cost a hunk of money to replace a switch in a piece of computer equipment—but only another eight bucks to replace the remote switch. If David wants the super-duper whizbang surge-suppressing device, he should complain about his cravings, not about Apple.

Loy Spurlock
La Mirada, California

Finding the Right 7.0 Book

WHY THE COMPARISON TABLE uses the authors rather than the titles to identify the books is beyond my ken (*The Desktop Critic*, April 1992). Throughout the body of the article, the various titles are highlighted in boldface type and easily spotted. In the concluding paragraph, David Pogue sums up his comments with reference to the books' titles, then asks you to use the table as a quick guide. When you go to the table, you have to scramble through the article to discover which author wrote which book. And he is criticizing the reference manuals' clarity? Yikes!

continues

Which Comes First...

DUAL PAGE MONO-CHROME DISPLAY WITH VIDEO CARD

Screen size (flat) —
19 inch diagonal
Resolution — 74 DPI
WYSIWYG (same as
Apple Two Page)
Vertical Refresh
Rate — 75 Hz

FULL PAGE MONO-CHROME DISPLAY WITH VIDEO CARD

Screen size (rounded) —
15 inch diagonal
Resolution — 80 DPI
WYSIWYG (same as
Apple Portrait)
Vertical Refresh Rate —
75 Hz (same as Apple
Portrait)

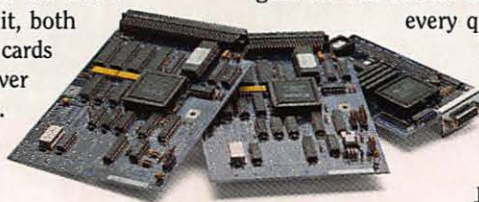
FULL PAGE GRAY-SCALE DISPLAY (256 SHADES) WITH VIDEO CARD

Screen size (flat) —
15 inch diagonal
Resolution — 80 DPI
WYSIWYG (same as
Apple Portrait)
Vertical Refresh Rate —
75 Hz (same as Apple
Portrait)



The Display Card or the Display?

Silly question. For Lapis owners that is. You won't have to spend another second debating which comes first, because at Lapis they both do. Take our cards, for instance. For those of you who already have a monitor, we've got the most comprehensive line of display cards to drive it, both monochrome and color. We also have display cards for every Macintosh computer. In fact, you'll never have to go anywhere else for a display card. We've got all the bases covered. And when you turn to Lapis for a display solution, whether dual page mono-chrome, full page gray scale or full page monochrome, you'll get more than just a monitor, you'll get an entire system, Lapis card and all. You see, sometimes



Lapis has a full line of Apple-compatible, fixed and programmable, display cards.

it's okay to put all of your eggs in one basket. So whether you're in the market for a display card or a complete display solution, Lapis makes sure that you'll always come out first. Of course that also goes for our service and support. We'll answer every question you ever wanted

to ask when you call our technical support line. (Just don't try that chicken and egg one, it gets 'em every time.) Just call us at 1-800-43-LAPIS for the location of the nearest Lapis dealer. Any more questions?



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End users circle 202 on reader service card

Dealers circle 204 on reader service card

Otherwise, the article is well written and worthwhile. However, as should be the case with most critics, I hope Pogue sticks to commenting on reference books, not writing them.

*Juan Martinez
Oak Park, Illinois*

Artists' Effects

DEKE MCCLELLAND'S ASSESSMENT of Aldus Gallery Effects demonstrated to me what the lack of imagination in a reviewer can result in (*Reviews*, April 1992). The basic tools are presented in the program. Their use is dependent on the creativity of the artist using the medium. I rarely treat an entire image with a single effect. I mask parts of images and use the appropriate filter on the parts of the image that I feel can be best enhanced by it. It is a very creative tool if used with some degree of artistic license.

*Ed Foster
Cedarhurst, New York*

AS A COMMERCIAL ARTIST, I CONSIDER the new Gallery Effects among my most valuable programs. I have achieved some outstanding results. I do not know of the duplication with Photo-

shop McClelland refers to. There are some similarities in the names of some of the filters, but Gallery Effects' results are quite different. As for asking what real purpose these filters serve, that's like asking, "Why a brush, paint, and canvas?" To create, of course!

*Ronald Shattuck
Fairfax, Virginia*

What's Improved in Word

CONTRARY TO THE ADS AND THE reviews—yours included (*Reviews*, April 1992)—Microsoft Word 5.0 is not a major upgrade. The only real improvements are the better spelling checker, with its customizing options and double-word finder; and drag-and-drop editing. In fact, I'm surprised that drag-and-drop took so long. All applications should do this.

How about some real features like a better way to generate indexes other than those hidden codes; the ability to auto-number paragraphs, figures, and tables, as opposed to the unsatisfactory way Word does it now; and a way to dynamically refer to autonumbered paragraphs, figures, and tables.

*Paul Lucas
Urbana, Illinois*

Video Vision

THE SIDEBAR "UNDERSTANDING Video" begins with the number of horizontal scan lines in NTSC television, then jumps into a discussion of the number of vertical lines that can be resolved, without making that distinction clear ("Frame by Frame," March 1992). In summary, a computer's 15-inch shadow-mask monitor with holes on a .28mm pitch can display nearly four times more vertical lines than can an NTSC TV screen. That's why the vertical fans on the captured NTSC TV frames in the "Video-Capture Comparison" sidebar look so bad. Good tests that want better explanations, in my opinion. The rest of the article was very good.

*George Myers
Hicksville, New York*

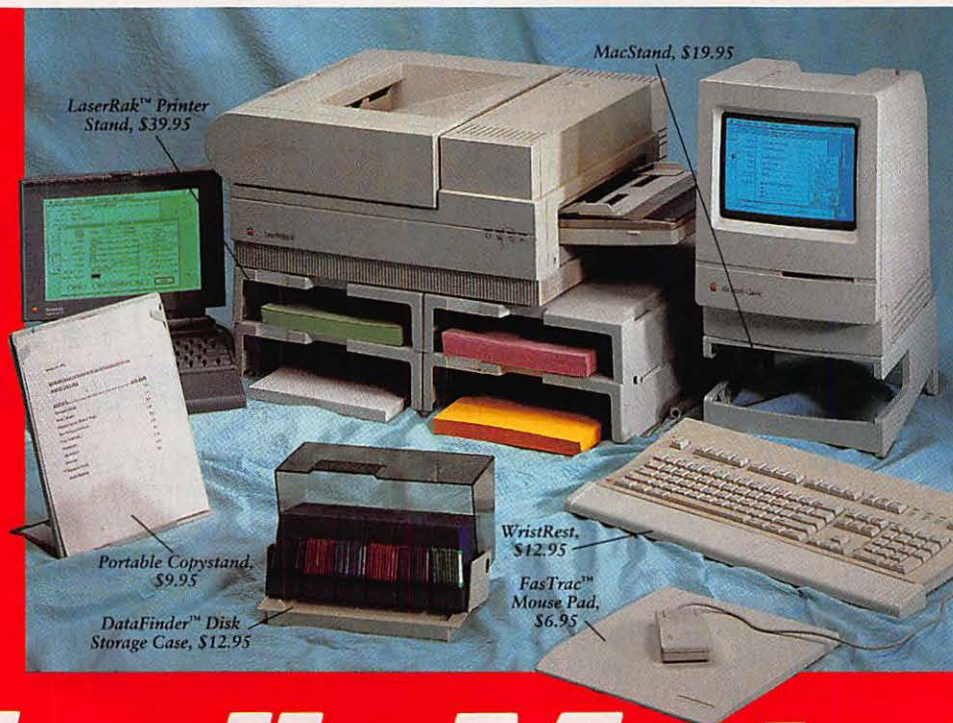
Thank you. As an additional clarification, although the RadiusTV board does not have a one-step feature for saving a frame directly to disk, the board does let users freeze a frame with the option of editing the frame before saving it as a PICT file. With QuickTime, the RadiusTV now can capture a sequence of frames. Radius also offers a \$599 option for upgrading its PrecisionColor 8X board to 16 bits.—Ed.

continues

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Quick Work with QuickKeys

LIKED TOM NEGRINO'S QUICKKEYS article (*Insights*, April 1992). I've been working in desktop publishing for three years, and I can honestly say that I practically doubled my work speed when I started using QuickKeys. There are many operations I find routine and repetitive, such as pulling down menus, handling dialog boxes, and so on. QuickKeys has relieved me from the doldrums of these constant chores and allowed me to concentrate on more important aspects of my work. It lets the Macintosh do what it does best: repetitive chores. I'm glad this article further touts the advantages of this macro utility. In fact, it taught me a few things, too!

*Tze-Chiu Lei
Berkeley, California*

Definitive Low-Cost

SAW THE WORDS "LOW-COST MONITORS" on the cover and immediately turned to the article ("Color Display Bargains," March 1992). I was disappointed to find the cheapest monitor being reviewed cost \$600, and that's not including the \$400 color board. My idea of low-cost

monitors are the 14-inch displays from Mirror Technologies, Magnavox, Orion Technologies, GoldStar, and Generation Systems, all of which cost less than \$500.

*Richard Fritsky
Tabernacle, New Jersey*

As the feature pointed out, several mail-order firms offer low-cost monitors, usually adapted from low-cost VGA monitors sold for DOS PCs. However, none of the companies had products to send us for testing, since the suppliers of these monitors (GoldStar and Hitachi) were changing their product lines. Be aware that the components used in lower-cost products can change at any time as suppliers change, which means that results published in magazines may not apply a few months later. Magnavox is a brand name for monitors from Philips Consumer Electronics; Magnavox monitors were covered in the article.—Ed.

Don't Worry; Play Games

MAXIS COMMITS A SEVERE CRIME every day. Look at SimCity. How clever: you lay out a design for a city, and hope that the Sims like it. But alas, Maxis has given you a small inconspicuous red sheet containing the answers for literally thousands of possible copy-protection questions. In a busy household, one tiny

little red sheet can get trashed so easily! Avoid this rather overly copy-protective company, or your \$50 game may lose even a cent of its value.

*Neil Irwin
Spartanburg, South Carolina*

Maxis has said that as of May 1 it will publish an unprotected SimCity, and it has no plans to include copy protection on future games.—Ed.

IRS Eyes Software

PURCHASED MY MACINTOSH IN April 1989 along with some software. I was aware that in all cases the software came with a license agreement that says I do not own the software; in essence, what I was buying was a license that permitted me only to use the software. Given that, I have taken the position that if I do not own the software, I have no proprietary interest in or title to a tangible asset. So I expense the cost of the license fee.

Now for the kicker. My 1989 tax return was selected for an audit. The examiner has arbitrarily decided that all my software licenses are capitalizable software licenses with an amortizable life of five years. Needless to say, I'm not about to

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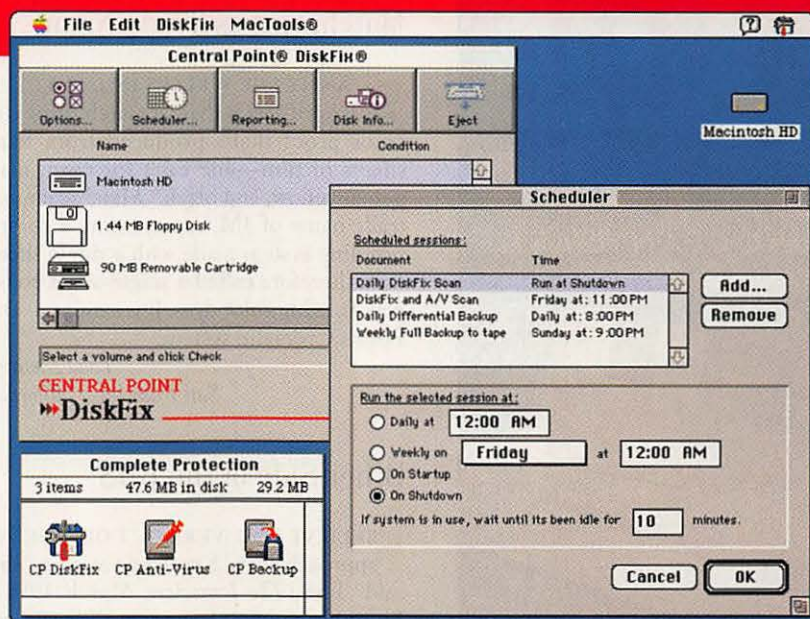
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stand still for what I consider to be no more than a heavy-handed attempt to extort additional taxes from me.

*John Amos
South San Francisco, California*

The tax courts have not ruled on software per se, and the IRS is treating software as the equivalent of a computer peripheral in the meantime. Amos had already reached the \$10,000 limit on one-year amortization with his computer equipment, so by current IRS law, the software needs to be amortized over five years. Amos is still appealing his case. See "Home-Office How-To," in this issue, for more information on taxes and home businesses.—Ed.

Matchprint as Trade Name

DANNY LEE WRITES IN *LAB NOTES* (April 1992) that "a match print is a color proof that's produced from four sheets of film—one each for cyan, magenta, yellow, and black." Matchprint is a trade name of 3M, representing a color-proofing system made with a single sheet (and therefore called a single-sheet color proof), using color dyes. It is similar to Du Pont's Cromalin system.

*Thad McIlroy
San Francisco, California*

Other Side of the BBS

I BELIEVE YOU WERE OUT OF LINE TO approach Jerry Saperstein with a "she said" line (*The Iconoclast*, March 1992). Not only did you not print all the facts, JerryType now looks like some sort of hero. Thank you sarcastically from everyone who has ever tried to deal with this type of person. Did you ask other members of any online services what they think of a person who does the type of things JerryType does?

Your article did not discuss the issues of online lynching. You merely stated some inconveniences and then sloughed them off by saying, oh, freedom of speech, I guess it's OK after all.

*Page Gilley
Wilmington, North Carolina*

More Macs in the Cold

AFTER READING ABOUT THE DIFFICULTIES in obtaining supplies for a Mac in Western Samoa (population 160,000), where the inhabitants own some 30 Macs, I decided to drop you a line (*Letters*, March 1992).

It must be better to run a Mac in an igloo than in a straw hut, as there are 10,000 Macs in Iceland (population

250,000). This means that every fourth igloo has a Macintosh, and the number of the unmentionables (IBM PCs and clones) is probably double this at least, so approximately every other igloo in Iceland has a computer. This is probably a world record per capita and definitely a record per igloo.

*Fridrik Hjartason
Reykjavik, Iceland*

The MIDI School

THE APRIL 1992 ISSUE CONTAINED A brief article on Thomas Dolby's use of computers and highly sophisticated software to produce his latest album (*Profile*). Also mentioned was the possibility of Dolby starting a school that would train people to use that type of software. Do you know where I could get more information regarding this school?

*David Nace
Greensboro, North Carolina*

Thomas Dolby may teach at a school that may be founded this year. For more information, write to Collier Management, 3960 Laurel Canyon Blvd., #304, Studio City, CA 91614. Engineers and musicians may also be interested in Cogswell Polytechnical College's Music Engineering Technology Program, which encompasses MIDI, sound design, and audio recording technology (408/252-5550; fax 408/253-2413).—Ed.

Future Art Master?

IF YOU ARE PLANNING FOR A FIFTH Macintosh Masters Showcase, I wish to enter ("1991 Macintosh Masters Showcase," April 1992).

Could you send any information on enrollment forms, requirements, deadlines, and locations for this contest or any similar events in the future?

*Geri Loudenslager
Treviso, Pennsylvania*

The 1991 Macintosh Masters contest was announced in the June and July 1991 issues, with entry forms and guidelines, as are similar contests announced. We have not set a date for the 1992 contest.—Ed.

Letters should be mailed to *Letters*, *Macworld*, 501 Second St., San Francisco, CA 94107, or sent electronically to CompuServe (70370.702), MCI Mail (294-8078), America Online (Macworld), or Apple-Link (Macworld1). Include a return address and a daytime telephone number. We regret that, due to the high volume of mail received, we are unable to respond personally to each letter. We reserve the right to edit all letters. All published letters become the property of *Macworld*. **m**

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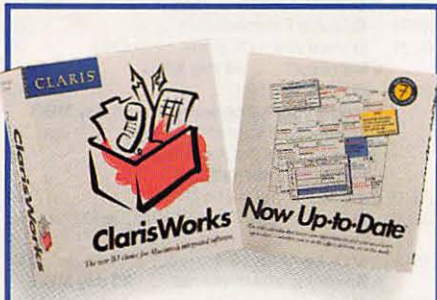
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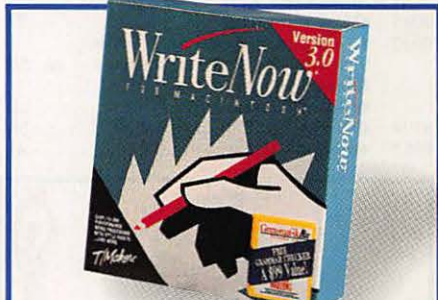
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- ★ **Survivor Software ... 30 day MBG**
- 3289 **MacMoney 3.52** ... 58.
- ★ **Symantec ... 60 day MBG**
- 2237 **GreatWorks 2.0** ... 199.
- 2278 **GreatWorks Upgrade** ... 99.
- 3422 **More 3.1** ... 265.
- ★ **Symmetry ... 30 day MBG**
- 3131 **Acta 7 1.0** ... 75.
- ★ **Synergy ... 30 day MBG**
- 6617 **KaleidaGraph 2.1.3** ... 150.
- ★ **Telaware ... 30 day MBG**
- 7616 **M.Y.O.B. 3.0 (May '92)** ... 138.
- ★ **TIMESLIPS ... 30 day MBG**
- 2986 **Timeslips III 2.1** ... 194.
- 8939 **Accounting Link 1.0B** ... 52.
- ★ **T/Maker ... 30 day MBG**
- 3639 **WriteNow 3.0 (May '92)** ... 149.
- 5259 **WriteNow 3.0 Upgrade (May '92)** ... 49.
- 5253 **WriteNow 3.0 Competitive Upgrade** ... 69.
- ★ **Vertical Solutions ... 60 day MBG**
- 5886 **FastLabel 3.1** ... 45.



★ **T/Maker ... 30 day MBG**
 3639 **WriteNow 3.0**—The fastest Mac word processor. Includes Grammatik Mac, a lightning-fast 135,000-word spell checker, a thesaurus DA, powerful style sheets, and Microsoft Word compatibility ... \$149.

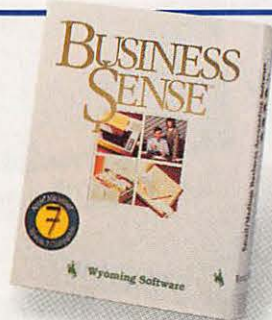
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MacConnection®

14 Mill Street, Marlow, NH 03456 603/446-3333 FAX 603/446-7791

When car seats and



★ **Wyoming Software ... 30 day MBG**
3555 **Business Sense 1.6**—Takes accounting into the next century. Fully integrated A/P, A/R, Payroll, Budgeting, Invoicing and “dynamic, deep” Importing and Exporting. Simple-Clear-Complete \$124.

- ★ **Williams & Macias ... 30 day MBG**
4976 **StickyBusiness 1.5** 51.
6926 **myDiskLabeler III 3.1** 42.
- ★ **WordPerfect ... 60 day MBG**
3800 **WordPerfect Mac 2.1** 279.
3090 **WordPerfect Office 3.0 (single)** 89.
3092 **WP Office (5 pack) 295. 3088 (20 pack) 895.**
- ★ **Wordstar ... 30 day MBG**
3554 **American Heritage Dictionary 1.0.** 55.
6984 **Correct Grammar 3.01** 55.
5281 **Correct Writing, Quotes, & Letters.** 75.
- ★ **Working Software ... 60 day MBG**
5897 **Findswell 2.2** .. 23. 5636 **Lookup 2.2** .. 30.
5896 **Last Resort 1.0 or 4699 Spellswell 2.2** .. ea. 38.
- ★ **Wyoming Software ... 30 day MBG**
3555 **Business Sense 1.6** 124.

GRAPHICS & DESIGN PUBLISHING, PRESENTATIONS

- ★ **Abracadata, Ltd. ... 30 day MBG**
9995 **Instant Decorator 1.1** 29.
9990 **Design Your Home - Architecture, 9992 Interiors, or 9994 Landscape** .. ea. 59.
- Adobe Systems**
8794 **Adobe Type Library (Vol. 1-260)** call
6957 **Adobe Type On Call (CD-ROM).** 56.
6957 **Adobe Type Reunion 1.0.2** 41.



Adobe Systems

4145 **Adobe Premiere 1.0**—Create high-quality digital movies by combining video footage, audio recordings, animation & graphics. \$305.
6644 **Adobe Photoshop 2.01** 548.
8171 **Adobe Illustrator 3.2 (w/ATM)** 368.

- 5750 **Adobe Type Manager 2.0.3** \$59.
6053 **Adobe Plus Pack 2.0** 118.
6156 **Adobe Plus Pack/ATM** 175.
6098 **TypeAlign for ATM 1.0.4** 61.
5001 **Adobe Streamline 2.0** 122.
4145 **Adobe Premiere 1.0** 305.
8171 **Adobe Illustrator 3.2 (with ATM)** 368.
6644 **Adobe Photoshop 2.01** 548.

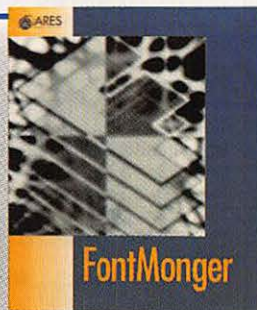
Adobe Type Sets for Business:

- 2221 **Letters, Memos & Faxes** 95.
2223 **Invitations & Awards** 95.
2219 **Spreadsheets & Graphs** 95.
2222 **Overheads & Slides** 95.

- ★ **Aldus ... 30 day MBG**
6674 **Aldus Personal Press 2.0** 132.
2461 **Aldus Gallery Effects 1.0** 128.
3506 **Aldus SuperPaint 3.0** 132.
3980 **Aldus Digital Darkroom 2.0** 259.
3507 **Aldus Super 3D 2.5** 325.
4751 **Aldus Persuasion 2.1** 325.
1330 **Aldus FreeHand 3.1** 394.
7088 **Aldus PageMaker 4.2** 494.

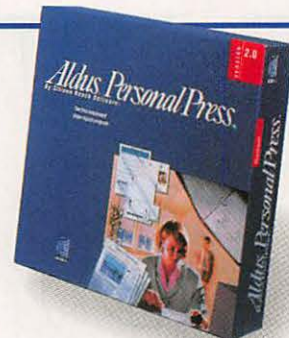
Altays

- 9806 **Metamorphosis Pro 2.03** 89.
1983 **EPS Exchange 2.0** 89.
1195 **Fontographer 3.5** 259.



★ **Ares Software ... 30 day MBG**
8878 **FontMonger 1.5**—Converts type formats between PostScript Type 1 (for use in Adobe Type Manager), Type 3 & TrueType (for System 7.0). Generates customized typefaces & characters such as obliques, fractions & small caps .. \$93.

- ★ **Ares Software ... 30 day MBG**
8878 **FontMonger 1.5 (May '92)** 93.
- ★ **Baseline Publishing ... 30 day MBG**
8055 **Screenshot 1.2** 34.
2249 **Type Treasury CD (Type 1 & True Type Fonts)** 45.
..... **Type Essentials (coordinated collections)** call
- Broderbund Software**
3572 **Kid Pix 1.2** 34.
1427 **The Print Shop 1.3.2** 35.
6281 **TypeStyler 2.0 (with ATM)** 126.
- ★ **Casady & Greene ... 30 day MBG**
8879 **Fluent Font Library 4.05** 99.
1945 **True Type Starter Set** 57.
- ★ **Claris ... 30 day MBG**
1123 **MacPaint 2.0** 86.
2518 **MacDraw Pro 1.01** 275.
8007 **Claris CAD 2.0** 599.
- Custom Applications**
8037 **Freedom of Press Light 3.03 (17 fonts)** .. 84.
- ★ **DeltaPoint ... 60 day MBG**
3558 **DeltaGraph Pro 2.0** 199.
- ★ **Deneba Software ... 30 day MBG**
3227 **Canvas 3.02** 248.
- ★ **Expert Software ... 30 day MBG**
4870 **Expert Color Paint 1.0** 29.
- ★ **Foundation Publishing ... 60 day MBG**
9438 **Comic Strip/People & Kid Stuff** 71.



★ **Aldus ... 30 day MBG**
6674 **Personal Press 2.0**—New version, System 7 savvy. Page layout program intelligently assembles text & graphics automatically. Features “Intelligent” templates, Copy Fitting, AutoFlow, word processing text wrap, etc. \$132.

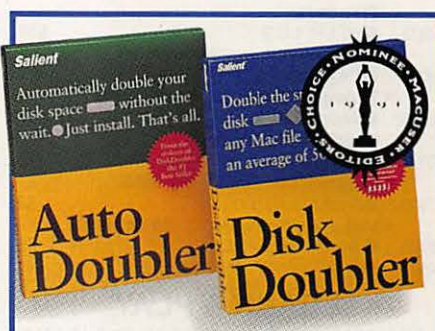
- Fractal Design**
5425 **Painter 1.2** 235.
- IDB/Innovative Data Design**
2417 **MacDraft 2.1** 279.
- ★ **Letraset ... 30 day MBG**
4709 **LetraStudio 2.0 (May '92)** 139.
..... **FONTEK Typeface Collection** ea. 30.
- Light Source**
3733 **Ofoto 1.1.1** 279.
- ★ **Linguist's Software ... 60 day MBG**
..... **Over 100 language fonts** call
2569 **Cyrillic II or 2584 TransCyrillic** ea. 99.
- ★ **MacroMedia ... 30 day MBG**
3148 **Magic** .. 275. 5028 **ModelShop II** .. 619.
7441 **Swivel 3D Professional 2.0** 479.
3450 **SwivelMan 1.0** 619.
- ★ **Mainstay ... 30 day MBG**
9798 **Capture 4.0** 82.
- ★ **MicroFrontier ... 30 day MBG**
3013 **Color It! 2.0 (June '92)** 73.
- ★ **MicroMaps ... 30 day MBG**
7556 **MapArt (PICT) or 7555 (EPS)** ea. 89.
2791 **Global Perspectives 1.0** 25.
6031 **MapPack: U.S. States by County** 25.
- ★ **Microsoft ... 30 day MBG**
2878 **PowerPoint 2.01E** 245.
- ★ **Monotype Typography ... 30 day MBG**
..... **Monotype Imprints-TrueType** ea. 22.
..... **Classic Fonts (full line available)** call
- Postcraft International**
2210 **Effects Specialist 1.04** 89.
2200 **Layouts PageMaker or 2414 QuarkXPress** 69.
- Quark**
7612 **QuarkXPress 3.1** 549.
- ★ **Specular International ... 30 day MBG**
4962 **Infini-D 1.1** 647.
3543 **Replicas (vol. 1) or 3675 (vol. 2)** .. ea. 189.
- ★ **Spinnaker ... 30 day MBG**
3530 **Certificate Maker 2.02** 22.
- Strata**
7773 **Stratavision 3D 2.5** 629.
- ★ **SuperMac Technology ... 60 day MBG**
3380 **PixelPaint 2.1** .. 149. 5625 **Pro** .. 459.
- 3G Graphics**
6379 **Accents & Borders 1** 63.
4583 **Business 1** .. 63. 2003 **People 1** .. 94.
- ★ **Timeworks ... 30 day MBG**
7115 **Publish It! Easy 2.1 w/File-It!** .. special 89.
- ★ **T/Maker ... 30 day MBG**
..... **ClickArt (7 bitmapped)** ea. 38.
..... **ClickArt (5 EPS formats)** ea. 82.
1858 **FaxMania (birthdays - bulletins)** special 29.
- ★ **Virtus Corporation ... 30 day MBG**
4488 **WalkThrough 1.03** 309.

sunburns will sear.



After Hours Software
1352 **TouchBASE 2.0.1**—Multi-user database designed to keep track of personal and business contacts. It's a handy desk accessory that can print envelopes, labels, address books, fax cover sheets, reports, and much more \$79.

- ★ **Central Point** ... 30 day MBG
- 5041 **Mac Tools Deluxe 2.0 (June '92)** ... \$92.
- ★ **Claris** ... 30 day MBG
- 8734 **HyperCard Development Kit 2.1** ... 139.
- ★ **Connectix** ... 30 day MBG
- 7830 **Maxima** ... 45. 6647 **HandOff II** ... 55.
- ★ **Dantz Development** ... 30 day MBG
- 3393 **DiskFit Pro 1.0** ... 72.
- 5255 **Retrospect 147**. 7945 **Remote 1.3** 264.
- 7946 **Remote (10 Pak)** 147. 3112 **(50 Pak)** 649.
- Dubl-Click Software**
- 6653 **MenuFonts**. 44. 7974 **ClickChange**. 55.
- ★ **ElseWare Corp.** ... 30 day MBG
- 4871 **Checklist 2.02** ... 89.
- ★ **Fifth Generation** ... 30 day MBG
- 4287 **PYRO! 4.01** ... 27.
- 3955 **Suitcase II 2.0** ... 53.
- 8286 **SuperLaserSpool 3.0** ... 99.
- 5178 **FastBack Plus** or 5725 **DiskLock** ea. 125.
- ★ **FWB, Inc.** ... 30 day MBG
- 2999 **Hard Disk Toolkit 1.1** ... 125.
- ★ **ICOM Simulations** ... 30 day MBG
- 6296 **Intermission 1.0** ... 38.
- 3731 **OnCue II 2.0** ... 55.



★ **Salient Software** ... 30 day MBG

4838 **AutoDoubler 1.0.6**—Automatically double the space on your drive \$45.

7404 **DiskDoubler 3.7.5**—Award winner. Compress files for telecommunication, backups, or transfer to floppies. Can use w/AutoDoubler 45.

PROGRAMMING UTILITIES, HYPERCARD, SECURITY

- ★ **Abbott Systems** ... 30 day MBG
- 2515 **Calc+ 1.0** 39. 5236 **CanOpener 2.0** 62.
- ★ **Advanced Software** ... 30 day MBG
- 8051 **Intouch 1.1** 39. 9986 **Network (3-Pak)** 112.
- After Hours Software**
- 1352 **TouchBASE 2.0.1** ... 79.
- 3314 **DateBook (May '92)** ... 79.
- ★ **Aladdin Systems** ... 30 day MBG
- 6740 **StuffIt Deluxe 2.01** ... 55.
- ★ **Aldus** ... 30 day MBG
- 5100 **Aldus SuperCard 1.6** ... 195.
- ★ **ALSoft** ... 30 day MBG
- 9808 **MasterJuggler 1.57B** ... 25.
- 9807 **DiskExpress II 2.11** ... 49.
- 5204 **ALSoft Power Utilities 1.01** ... 64.
- ★ **Alysis Software** ... 30 day MBG
- 2687 **SuperDisk!** ... 49.
- 1608 **More Disk Space** ... 55.
- Apple Computer**
- 1074 **System 7 (with free PCTV video)** ... 99.
- ★ **ASD Software** ... 30 day MBG
- 5 & 10 users packs available.
- 7085 **FileGuard 2.7 (1 user)** ... 138.
- 2552 **WindoWatch (1 user)** ... 91.
- ★ **Baseline Publishing** ... 30 day MBG
- 7783 **INIT Manager 1.1** ... 33.
- 3114 **INIT Info Pro 1.0** ... 39.
- ★ **Berkeley Systems** ... 30 day MBG
- 5737 **After Dark 2.0V** ... 28.
- 2198 **More After Dark (M.A.D.)** ... 23.
- 2196 **After Dark & M.A.D. Bundle** ... 39.
- ★ **Casa Blanca Works** ... 30 day MBG
- 1593 **Drive 7 2.0** ... 49.
- 1573 **DriveShare (May '92)** ... 89.
- ★ **Casady & Greene** ... 30 day MBG
- 2269 **QuickDEX 2.3** ... 22. 2528 (5 Pak) ... 99.
- ★ **CE Software** ... 60 day MBG
- 1727 **CalendarMaker 3.0.1** ... 31.
- 6278 **DiskTop 4.01** or 3376 **Tiles 1.01** ... 63.
- 7518 **Alarming Events 1.03** ... 84.
- 8024 **QuickKeys² 2.12 (May)** 93. 1565 **(10)** 749.



★ **ASD Software** ... 30 day MBG

MacAccessCard Reader combined with FileGuard 2.7 secures your Mac against unauthorized users.

7085 **FileGuard 2.7 (1 user)** \$138.

9440 **MacAccessCard Reader (reqs. FileGuard)** .. 299.

9439 **MacAccessCard/FileGuard (1) Bundle** .. 399.

- ★ **Insight Development** ... 30 day MBG
- 6171 **MacPrint 1.3** ... 92.
- ★ **Kensington** ... 30 day MBG
- PassProof (right, left, Classic, IIs)** .. ea. 65.
- ★ **Kent Marsh Ltd.** ... 30 day MBG
- 9513 **FolderBolt 1.02** ... 73.
- 1839 **The NightWatch II (May '92)** ... 89.
- ★ **Kiwi Software** ... 60 day MBG
- 6267 **Kiwi ENVELOPES! 3.1.5** ... 32.
- 3518 **Kiwi POWER WINDOWS** ... 50.
- ★ **Magic Software** ... 30 day MBG
- 7267 **AutoSave II** 26. 7270 **Backmatic** 50.
- ★ **Microcom** ... 30 day MBG
- 4803 **Virex/Mac** .. 57. 5885 **(10 user)** .. 399.
- 8561 **911 Utilities** or 2462 **Citadel w/Shredder** 89.
- MicroMat Computer Systems**
- 3732 **MacEKG II (May '92)** ... 110.
- ★ **Microseeds Pub.** ... 60 day MBG
- 7068 **INITPicker 2.02** ... 34.
- 2913 **Redux 1.63** or 2936 **HAM** ... 49.
- ★ **Microsoft** ... 30 day MBG
- 4471 **QuickBasic 1.0** ... 64.

- ★ **Nine to Five Software** ... 30 day MBG
- 9767 **Reports 2.1** ... 94.
- 2832 **Attributes 2.0** 50. 2835 **Search 2.0** 62.
- ★ **Now Software** ... 30 day MBG
- 1793 **Now Up-To-Date 1.0 (1 user)** ... 65.
- 2371 **(5 user)** ... 259. 2366 **(10 user)** ... 395.
- 6925 **Now Utilities 3.01** ... 83.
- ★ **ON Technology** ... 1 year MBG
- 6385 **On Location 2.0** ... 75.
- 1566 **STATUS-Mac 2.0.2 (unlimited)** ... 749.
- Palomar Software**
- 8210 **PLOTTERgeist 2.0** ... 249.
- ★ **Salient Software** ... 30 day MBG
- 7404 **DiskDoubler 3.7.5** ... 45.
- 4838 **AutoDoubler** 45. 6092 (10 pak) 295.
- ★ **Symantec** ... 60 day MBG
- 5176 **Symantec AntiVirus for Mac (SAM)** ... 64.
- 5724 **Symantec Utilities for Mac (SUM II)** ... 96.
- 6748 **Norton Utilities for Mac 2.0 (May '92)** ... 95.
- 3421 **THINK Pascal 165**. 2688 **THINK C** 199.
- 9957 **THINK Reference 1.0** ... 68.



★ **Microcom** ... 30 day MBG

Complete disk and file recovery and protection.

8561 **911 Utilities 1.0** \$89.

4803 **Virex/Mac** 57.

2462 **Citadel with Shredder 1.0** 89.

8562 **Complete Undelete 1.1** 48.

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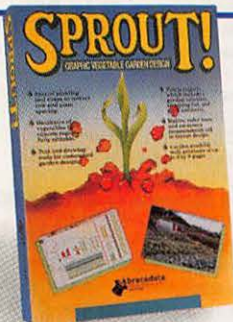
But inside with Mac

Teknosys		
5203	HELPI! 1.0.2	\$89.
★ TGS Systems ... 60 day MBG		
6667	Prograph 2.5	309.
★ Thought I Could ... 30 day MBG		
4843	Wallpaper 1.0.1	37.
UserLand Software		
4753	Frontier.	189.
★ Utilitron, Inc. ... 30 day MBG		
1340	TrashMaster 1.0	39.
★ Visionary Software ... 30 day MBG		
3888	Synchronicity 3.0	35.
3887	First Things First 2.1	41.

LEARN & PLAY

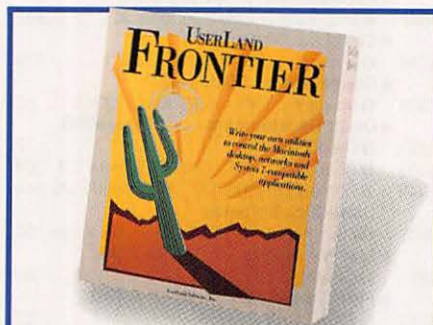
FOREIGN LANGUAGES, TRAINING, GAMES

★ Abracadata, Ltd. ... 30 day MBG		
5805	Sprout! 1.0 (veggie gardens, May '92)	47.
Accolade		
1423	Hard Ball II 31. 8220 Jack Nicklaus Golf	34.
★ Aldus ... 30 day MBG		
3503	Dark Castle 1.2	34.
3502	Beyond Dark Castle 1.0	34.
★ Baseline Publishing ... 30 day MBG		
7785	Talking Moose 4.0.2	22.
★ Beacon Technology ... 30 day MBG		
4967	HyperBible (KJV) or 4968 (NIV)	ea. 125.



★ **Abracadata, Ltd.** ... 30 day MBG
5805 **Sprout! 1.0**—The complete planning tool for vegetable gardeners produces a graphic, scalable garden plan with correct plant and row spacing. Prints garden layouts, calendars, shopping lists, and reports ... \$47.

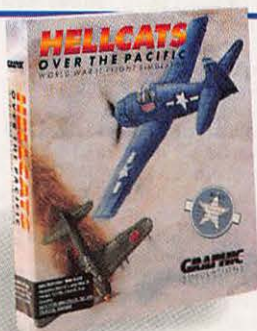
Broderbund Software		
4314	Typel 1.0	18.
6516	The Playroom 2.0 (CP) (color)	29.
	Carmen Sandiego Series (CP)	ea. 29.
5317	Spelunx and the Caves of Mr. Suedo	29.
9804	RoboSport or 8195 BannerMania	ea. 35.
5318	Nigel's World	35.
3559	SimAnt	35. 8266 SimEarth 1.1
4966	SimCity (CP)	29. 5871 Supreme
★ Carina Software ... 30 day MBG		
5726	Voyager 1.2	87.
★ Casady & Greene ... 30 day MBG		
3343	Aqua Blooper Piper or 3342 Glider	29.
4960	Fun Bundle (includes Crystal Quest w/CE, Sky Shadow & Mission Starlight)	59.
★ Centron Software ... 30 day MBG		
2707	Puzzle Master	26.
8525	Casino Master	39. 8524 (Color)
★ Cyan ... 30 day MBG		
6320	Manhole 1.6	19.
★ Davidson & Associates ... 30 day MBG		
3922	Talking Spell It Plus	29.
6128	Math Blaster Mystery	28.
2574	New Math Blaster Plus	34.
8278	Alge-Blaster Plus	34.
3923	Personal Trainer SAT	34.



UserLand Software

4753 **Frontier**—Power user's scripting system for System 7. Write & run your own utilities to customize the Mac file system, networks & applications. "Mac users have wanted something like this since 1984" (MacUser 12/91) \$189.

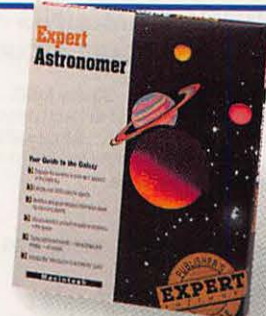
★ Deadly Games ... 30 day MBG		
2811	Bomber2 or 3460 Battle of Britain II	ea. 31.
EARTHQUEST		
8050	EARTHQUEST or 3118 Ecology 1.0	34.
5294	Time Treks 1.0	34.
Electronic Arts		
1303	Loom 1.0	29.
8194	Armor Alley 1.1 or 5702 4D Boxing	ea. 32.
1907	PGA Golf or 3385 Secret Silver Blades	39.
8643	Harpoon 39. 2962 Challenger Pak	59.
★ Expert Software ... 30 day MBG		
6219	Expert Astronomer 1.0	29.
FTL/Software Heaven		
1555	oids 1.2	24.
Graphic Simulations		
4756	Hellicats Over the Pacific 1.0	39.
★ Great Wave ... 30 day MBG		
2276	Kid's Time 1.3 or 5642 Kid's Math 1.1	25.
1517	ReadingMaze	25. 1513 (Color)
4334	NumberMaze	25. 8527 (Color)
8044	NM Decimals & Fractions (Color)	35.
★ HyperGlot Software ... 30 day MBG		
	Word Torture 4.0—Beginner to Advanced (Span., Fren., Germ., Ital. & Rus.)	ea. 34.
	Pronunciation Tutor - Beginner (Span., Fren.)	ea. 35. (Germ., Chin.)
	Tense Tutor 2.0 (Spanish, French, German, Italian)	ea. 38.



Graphic Simulations

4756 **Hellicats Over the Pacific 1.0**—Fast and fluid graphics, 256 colors and high-quality sound, transport you into the cockpit of an F6F Hellcat. Experience the excitement of an intense dog fight and a well-placed 500 pounder! \$39.

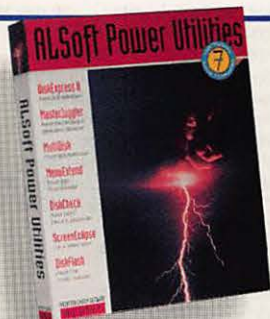
★ Inline Design ... 30 day MBG		
1562	3 in Three or 1944 Swamp Gas	\$31.
8809	Tesseract	31.
3414	Mutant Beach	43.
7622	Darwin's Dilemma 2.0 (May '92)	31.
Interplay Productions		
1894	BattleChess (3D animation)	29.
3520	Dvorak on Typing (June '92)	29.
1893	CheckMate (infinite play levels)	31.
3534	Castles 1.0 (June '92)	34.
★ Learning Company ... 30 day MBG		
2670	Reader Rabbit 3.0 (CP) (ages 4-7)	34.
3272	Super Solvers: OutNumbered! 1.0	34.
3687	Super Solvers: Midnight Rescue!	34.
3281	The Writing Center 1.0	51.
★ Leister Productions ... 30 day MBG		
7126	Reunion 3.0	115.
Mallard Software		
	Scenery Disks 1-4 Flight Simulator	ea. 19.
★ MECC ... 30 day MBG		
3963	Oregon Trail 1.0	28.
	Number, Word, or Super Munchers	ea. 28.
★ MicroMaps ... 30 day MBG		
2784	KidMaps 1.0	16.
★ Microsoft ... 30 day MBG		
2868	Flight Simulator 4.0 (CP)	42.



★ **Expert Software** ... 30 day MBG
6219 **Expert Astronomer 1.0**—Learn astronomy by displaying & printing the stars & planets from your location. View 9000+ celestial objects, track eclipses or comets. Perfect for novices or experts. Incl. Introduction to Astronomy guide. \$29.

★ Nordic Software ... 30 day MBG		
8258	Turbo Math Facts 1.0	24.
8260	Word Quest 2.1	30.
8257	PreSchool Pack - Color 1.0	34.
2716	Word Search Deluxe 1.04	34.
★ Penton Overseas ... 30 day MBG		
	VocabuLearn/ce Levels I & II (Span., Fren., Germ., Ital., Rus., Japan., & Heb.)	ea. 35.
	VocabuLearn/ce Level III (Span., Fren., Germ., Ital., Rus., & Japan.)	ea. 35.
	PICTURE-IT! (Spanish, French, German, & Italian)	ea. 40.
★ Personal Training Sys. ... 60 day MBG		
	Over 60 learning levels from beginner to advanced for System 7, QuarkXPress, Persuasion, FilmMaker Pro, PageMaker, Illustrator, FreeHand, Word, HyperCard, Excel & the Mac	ea. 59.
Sierra On-Line		
9733	Hoyle's Book of Games II	20.
2412	Rise of the Dragon	34.
7367	Space Quest III 34. 2522 Space Quest IV	39.
3545	EcoQuest (May '92)	35.
2523	King's Quest V	39.
3549	Police Quest III (July '92)	39.
3552	Leisure Suit Larry V	39.
Sir-Tech Software		
8229	Bane of Cosmic Forge	35.

your Connection's back



★ **ALSoft ... 30 day MBG**
5204 **ALSoft Power Utilities 1.01**—Seven performance enhancing utilities for a faster, safer & smarter Mac. Features DiskExpress II for intelligent disk optimization & MasterJuggler for easy font suitcase & applications mgmt. \$64.

- ★ **SoftStream ... 30 day MBG**
4489 **Galactic Frontiers** 38.
3501 **Classic Trilogy (Cribbage, Whist, Hearts)** 49.
3472 **Family Cards (Solitaire, Rummy, War)** ... 49.
Software Toolworks
4619 **Mavis Beacon Typing 1.3 (CP)** 32.
1908 **World Atlas 1.0** 52.
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8098 **ACT, GMAT, GRE, or SAT Prep** ... ea. 29.
Terrace Software
9970 **Mum's The Word Plus 1.01 (color)** ... 107.



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7946 **Retrospect Remote (10 Pack)** 147.

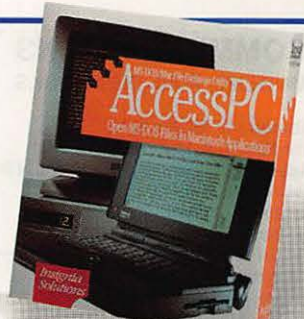
- ★ **Toyogo ... 30 day MBG**
7624 **NEMESIS Go Master 5.0** \$39.
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8188 **MusicProse 189.5804 Finale 2.6.1** 549.
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5486 **Sound Edit PRO 2.03** 207.
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9322 **Voyager Videostack CD 2.2** 65.

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2321 **CD-ROM Caddy . 11. 2533 (5 Pack)** ... 49.
8057 **Porta Drive CD-ROM** 599.
4140 **Multimedia HANDsc** 75.
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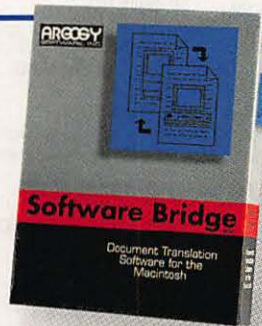
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DaynaPORT SCSI/Link: (BNC or 10BASE-T) 279.
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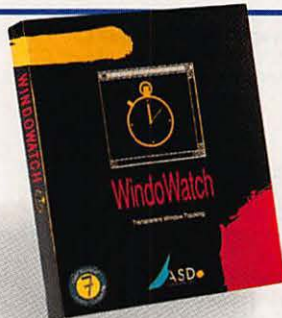
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4869 PhoneNET Connector 10-Pk (DIN8)... 198.
2206 PhoneNET StarController 307... 899.
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4814 PhoneNET StarController 377... 1299.
9961 PhoneNET Card PC... 209.
PhoneNET Ethernet Card (SE/30, II, si) ea. 173.
- *FreeSoft ... 30 day MBG**
6115 White Knight 11... 85.
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8945 TelePort/FAX 1.06... 169.
5327 TelePort/Full FAX 2.02... 219.
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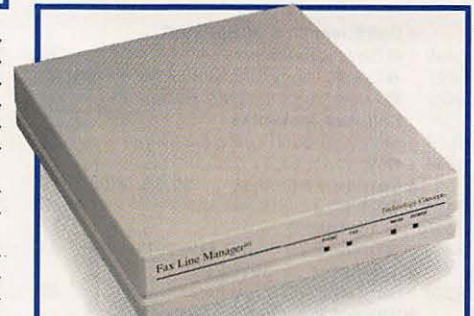
- 1345 OPTIMA 24 Modem... 155.
5971 OPTIMA 24 Modem (w/Smartcom & cable) 169.
3522 OPTIMA 96 Modem... 389.
5970 OPTIMA 96 Modem (w/Smartcom & cable) 399.
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5340 COMstation FOUR... 369.
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1496 Inst. Kit for 300/Color with Photoshop... 479.
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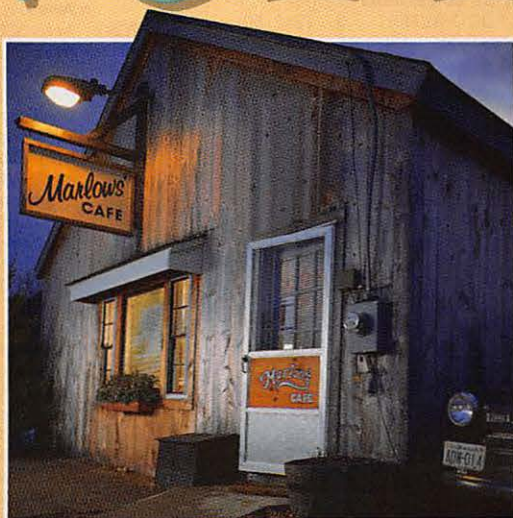
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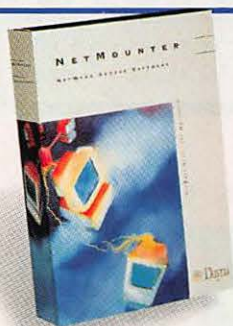
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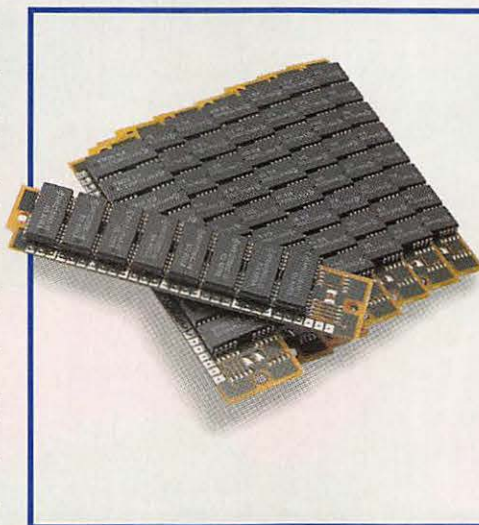
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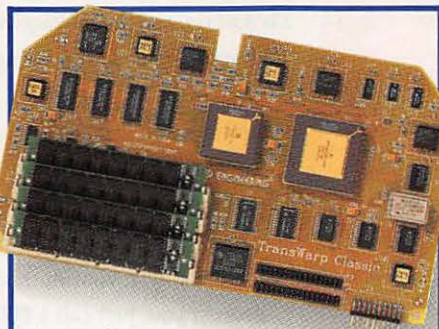
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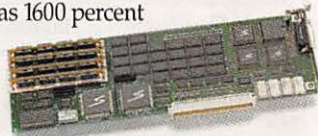
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SUPERMAC
The SuperSource for Color

Art Beat

Behind Macworld's Graphics

BY CATHY ABES

Artist: Along with his two partners, Jesse Doquilo and Randy Lim, Glenn Mitsui runs Seattle-based Studio MD, specializing in digital design and illustration. Mitsui's introduction to the Mac began when he designed presentation templates for Aldus Persuasion. "Our geographical location between Aldus and Microsoft prompted our firm to go online," says Mitsui. "Since then, our main target market has been the high-tech field."

Hardware: Mac IIcx with 20MB of RAM (on a Radius Rocket) with 340MB internal hard drive; 24-bit Radius DirectColor/GX accelerated color graphics board; 13-inch AppleColor High-Resolution RGB Monitor; Micronet 44MB removable-cartridge drive; Microtek 600ZS color ScanMaker.

Software: Aldus FreeHand 3.1; Adobe Photoshop 2.1; Fractal Design Painter 1.2.

How It Was Done:

The illustration that opens our feature on spreadsheets began life as a series of rough thumbnail sketches, which Mitsui scanned in gray-scale TIFF format and imported into FreeHand. He used the composite image as a template on which to build the illustration, working with only two layers (the lower layer for the template and the top layer for the actual illustration), which he traced over the template. For everything else, he used the Bring to Front and Send to Back commands to move objects around.

For two of the large three-dimensional numbers, the 3 and the 6, Mitsui used a font that was close to the shape he

wanted; after skewing each one, he redrew it with the pen tool to get the exact shape and form he wanted. The 2 and the 4 he drew from scratch. After creating the numbers, he skewed them slightly downward with the right side slightly lower than the left so that when he rotated them to fit into the grid, the baseline would be flush with the grid lines (for example, to make the base of the large 4 align with the road). To give each number an illusion of height, Mitsui duplicated it several times

and moved each duplicate straight up—simulating the extrusion technique of 3-D modeling programs. For more dimension, he added other details such as doorways, windows, smokestacks, and different floor levels.

Next Mitsui created the random numbers traveling the roads to Spreadsheet City. For these he used various fonts, scaling and skewing the numbers to fit the perspective of the drawing.

After drawing the other individual elements (the truck, the policeman, and the sign) Mitsui cop-

ied them into the existing file and resized them until they were in correct proportion to the rest of the elements. Before bringing the drawing into Photoshop, he refined it as much as possible in FreeHand because that program enabled him to quickly and easily do revisions, such as moving and scaling objects, that would be difficult or impossible to do in Photoshop.

Once he had finished these revisions, he saved each element (the large numbers, the policeman, the truck, the sign, and the

continues



The illustration that opens "Spreadsheets That Count," our comparison of Microsoft Excel, Claris Resolve, and Lotus 1-2-3.

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MacUser Magazine
November 1990

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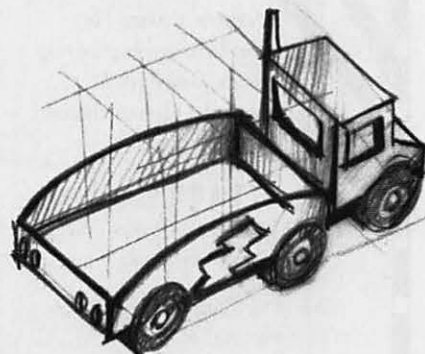
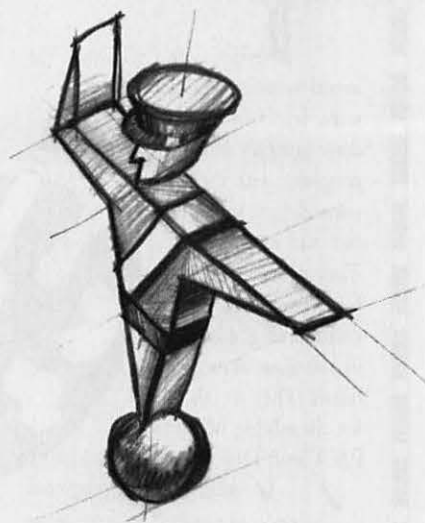
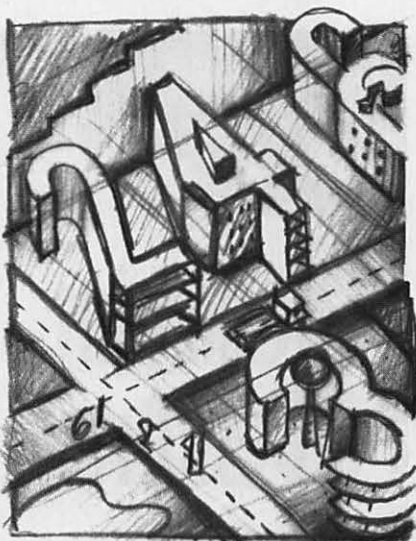
MacWeek Magazine
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Mitsui's original pencil sketches of the various elements of the drawing, scanned in as gray-scale TIFF images and composited into one FreeHand file for use as a template.

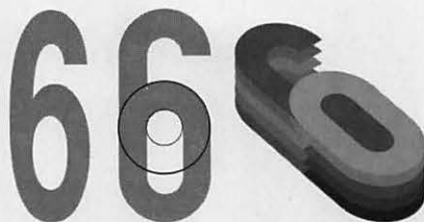
background) first as a separate FreeHand file and then as a separate PICT2 file for import into Photoshop. Mitsui saved each file in FreeHand format as well as PICT2 so that if he needed to make any changes, he could do them in the FreeHand file and then just replace the PICT2 file. (Since the default resolution for PICT2 files is 72 dpi, he also had to change that to 300 dpi for his final output.)



Two of these elements—the policeman and the truck—after Mitsui drew them in FreeHand and before he converted them to PICT2 format for importing into Photoshop.

In Photoshop, Mitsui's first step was to render the background, adding gradations and textures (he used similar techniques for the large 3-D numbers). After masking the green areas with the Pen tool he chose Save Path (from the Select menu) so that he could reselect the green areas later. Next he chose a greenish tan for the foreground and a dark green for the background and specified a linear gradation of the spreadsheet area. Because he knew that the RGB colors he was using would eventually have to be converted to CMYK colors for printing, during the color-selection process, he checked the Color Picker dialog box to make sure the colors he chose were within the CMYK gamut. Colors without CMYK counterparts would almost certainly look dramatically different in the final output.

Now Mitsui was ready to add the spreadsheet grid with text and numbers to the background. First he scanned an actual spreadsheet and skewed it to fit the perspective of the illustration. Then—to select just the grid lines, text, and numbers—he used the magic-wand tool to select one word and then chose Similar (from the Select menu) to select everything similar, in this case, everything black. After pasting the worksheet into the graduated area, he marquee'd this area, then copied and pasted it into a new Photoshop file and saved it as an RGB TIFF file. Next he opened this file in Painter 1.2, where he applied a paper texture with 40 percent opacity to the spreadsheet. After saving this as an RGB TIFF file in Painter, he opened it from within Photo-



The evolution of the 3-D number 6: (left) the original Helvetica Bold numeral that Mitsui used as a visual model; (middle) after Mitsui redrew the 6 to alter its structure; (right) after he'd skewed and rotated the 6 to achieve the proper perspective, duplicated it four times, and moved each duplicate up to add depth.



The FreeHand illustration, with all the elements (as placeholders) properly scaled and moved into place, ready to be imported into Photoshop where Mitsui added colors, gradations, and textures.

shop and copied and pasted the area into the original RGB TIFF file he'd created in Photoshop. Here he added a slight gradation for the road (from dark gray to black) and added the yellow dividing lines. The clouds were taken from a scanned photo. The yellow wall was drawn in FreeHand, gradations were added in Photoshop, and texture was added in Painter.

The small black sphere was created as a square in Photoshop, into which Mitsui typed various math operators at different sizes and thicknesses—in white on a black background. Then he used Photoshop's Spherize filter to transform the square into a sphere with a 3-D appearance. The sphere's highlights were added with the airbrush tool.

Mitsui spent about 10 hours designing and drawing the basic illustration in FreeHand and about 40 hours rendering it in Photoshop and Painter. The illustration's finished size (as an RGB TIFF file) was 23MB; after conversion to CMYK it became 30MB. **m**

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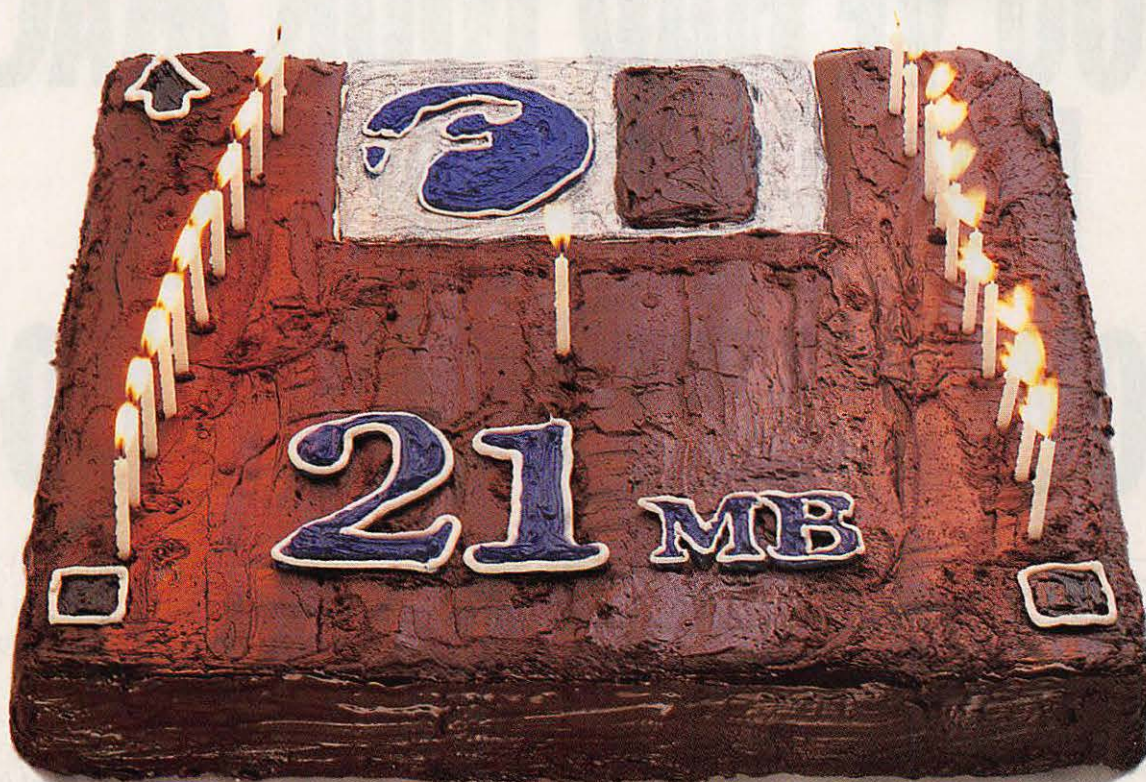
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SYMANTEC.

Livin' Large

BY STEVEN LEVY

IF I WERE TO LIST ALL THE items that would make me a complete person, a new version of my word processor would rank somewhere between a Salton breadmaker and a subscription to *U.S. News and World Report*. Yet somehow the idea that there is a new, improved version of Microsoft Word—called, in the snappy parlance of the software industry, 5.0—set my head spinning, my hopes aflame. Maybe this one would be better. So when the object of desire arrived on my doorstep, I ripped off the shrink wrap and rushed to the Mac, eager to take my new friend through its paces. It was then that I ran straight into a wall. No, make that *three* walls. And I bet you've hit them too. The wall of insufficient memory. The wall of insufficient storage space. And the wall of insufficient processor power.

My computer may not be a fire-breathing Quadra, but neither is it a creaky Mac Plus. (I tossed my cast-off Plus to my wife, who thinks it's normal to wait five minutes for her word processor to load.) It is a Macintosh IIx with a 68030 microprocessor, 5MB of memory, and a hard drive storing 80MB of data. For those who have so far managed to avoid knowing what that technobabble indicates, let's say this—if the Russians had gotten ahold of one of these babies 20 years ago, they might have won the cold war. This is computer power almost unthinkable a decade ago, and even 5 years ago people would have figured that with silicon like this on one's desktop, dispatching any task simpler than designing Strategic Defense weaponry would be a no-brainer.

But as it is, this machine is barely able to run the new word processor from Microsoft.

Stalled Install

WORD 5.0 IS ONLY ONE OF A NEW breed of livin' large Macintosh programs. They are the software equivalent of a James Joyce novel. That sly Irishman, you may recall, named his ideal reader as a person who would spend the rest of his or her life poring over one of Joyce's books. Likewise, a program like Word wants you to spend the bulk of your hard drive and all of your RAM running it. Now,

James Joyce was one heck of a writer, and Word is one doozy of a word processor. But with one life to lead and one Mac on the desktop, sooner or later you have to scream "Enough!" So I'm screaming—Enough already!

The problems begin with installation. In the old days—the eighties—installing a program on the Macintosh entailed but a few simple steps. You would insert the disk that held the program into your 1MB Mac SE, find the program icon, and drag it onto your hard drive. And the program would be installed. Today a megabyte is the penny you ante up with. To suggest that a program like Microsoft Word 5.0 should fit in less than 1MB of memory would be like saying that Donald Trump should squire Marla Maples about in a Geo. It is just not done.

The total storage requirement for Microsoft Word 5.0—including the program dictionaries, help, and other assorted paraphernalia—is about 6MB. Installing a program of this size is no picnic. Like many programs of its ilk, Word is too complicated to install using the trusty Macintosh protocols, so you have to hand everything over to a separate installation program that becomes, for a time, your personal exercise trainer, strengthening those key wrist muscles by coaching you to endlessly swap disks in and out of the machine. When you're finished, you have a folder that takes up space that might otherwise be occupied by the complete works of Ambrose Bierce.

Performance Anxiety

FINALLY, I WAS READY TO open the program. I reached for the mouse and double-clicked. Instead of the perky response to this event to which I have become accustomed, I got the dread cursor-watch. Without a stopwatch of my own, I cannot give you the precise amount of time that elapsed before the Mac was ready to work. But it seemed very long. Too long.

The next shock came when I tried to open up a second application. A dialog box informed me I was out of memory. Checking the About

This Macintosh box, I discovered that this new, improved Word occupied well over 2MB of memory. Combined with the even bigger chunk of RAM gobbled up by System 7 (see my previous ravings in the May issue about the size of *that* monster), this just about filled up what I had once assumed to be an extravagant expanse of memory.

I do not mean to condemn Word 5.0. Indeed, the new version includes many improvements. For instance, I like the ability to search by type style, and there is a neat feature that lets you instantly call up recently closed files. There are many other great features that I have not had the time to discover. Obviously a lot of work went into this upgrade, in anticipation, no doubt, of tithing Microsoft Word 4.0 users for the \$129 upgrade fee. Perhaps it was a desire to justify that fee that led Microsoft to assume that better had to mean bigger. As a result, on the majority of Macintosh computers now in use, we have a program that has every feature imaginable, is loaded with well-conceived shortcuts, can handle Russian novels as easily as memos—and is continually irritating because it's slow and hoggish.

It's not just Microsoft. (And to be fair, I must note that the company does tell users with memory-deficient Macs how to delete components of the program—which they paid for—to shoe-horn Word into a smaller space and allow it to run faster.) Most of the applications I see these days are livin' large monsters. A recent HyperCard stack came on five disks, and the swapping took more wrist action than a game of racquetball. Even some games these days take up 4MB or 5MB of code. By the time you install them, you are too tired to play.



*Out of
memory, out
of space,
out of luck*

Future Shock

CAN YOU IMAGINE IF THIS continues? In the spirit of fin de siècle panic, let me speculate on some of the standard programs that will run on your Macintosh on midnight, December 31, 1999.

continues

Microsoft Words When the delivery truck drops off the package of 80 floppies containing the new Words, you will be delighted with a whole new set of features, including a point-and-click etymology feature that tells the derivation of any word, along with its Indo-Chinese root. You won't believe you ever got along without it.

Mail merge now comes with a built-in franking privilege. The popular Translate module first included in version

49.1 now handles Serbo-Croatian, Hobbit, and Pig Latin.

In fact, over 7000 new commands have been added, any or all of which can be included or excised from the menu bars. Some of the newer ones include Change Word to Euphemism, Search by Nuance, Remove Pun, Make Up New Style, and Create Rebus.

Installing the full program will fill two magneto-optical drives, but you can save space by not loading large modules

like Poetry Generator, Etiquette Checker, and Film at 11.

Lotus 10-20-30 The new, improved spreadsheet from Lotus can accommodate more cells than electrons in the known universe. Also of note is the animated charting function that can display exploding pie charts, dynamic wire graphs, and a line graph with Nintendo's Super Mario tracing the ups and downs.

Of special interest is the Fudge Formula command on the menu bar. When Fudge Formula is chosen as the default, 10-20-30 automatically skews the numbers toward hopelessly optimistic projections, especially useful for seeking venture capital. Warning: 10-20-30 runs a little slow. Instead of the cursor changing to a wristwatch, you get a calendar.

40th Dimension The team that produced this version of the famous database code-named it Fields of Dreams. It was beta-tested by Mormons, who used it to catalog the genealogies of every human in North America. With a single keystroke, it's possible to find out all the second cousins of everyone in Chicago! And the program is still hardy enough to handle voluminous information on each person, along with scanned photos!

This version includes an extensive scripting language (unfortunately incompatible with the approximately 300 scripting schemes for various other Mac programs) that makes it possible for MIS wizards to dazzle their bosses by automating the most mundane tasks.

As befits a serious database, speed is secondary to power, but each copy of 40th Dimension comes with a free Nintendo Game Boy to while away the time as the Mac is fulfilling queries.

MacDrawnOut Claris's absolute breakthrough in image creation. The tear-off toolbox has 721 icons representing different brushes, shapes, and effects, including some never seen and a few that never work. When you draw a box in MacDrawnOut, a simple keystroke can change the color of the box, fill it with one of thousands of different patterns (including your own family tartan), and generate an infinite fractal pattern.

You can save your images in 41 different formats, including PICT, TIFF, JIF, ASCII, NASA, ASCAP, and FUBAR. The program also comes with templates for easy creation of forms, blueprints, storyboards, and domestic and foreign currency.

MacDrawnOut runs on all Macs, but users with pre-1996 Quadras should allow 40 minutes each time the screen redraws. For best results, Claris recommends a two-teraflop machine.

continues

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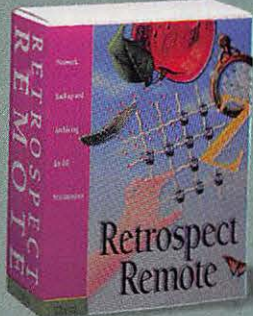
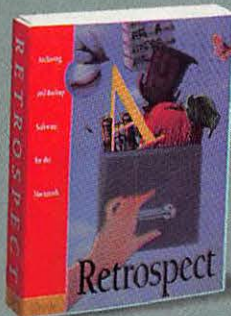
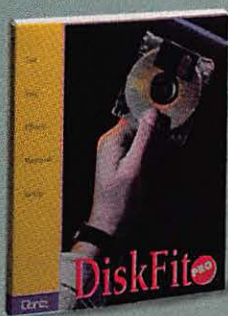
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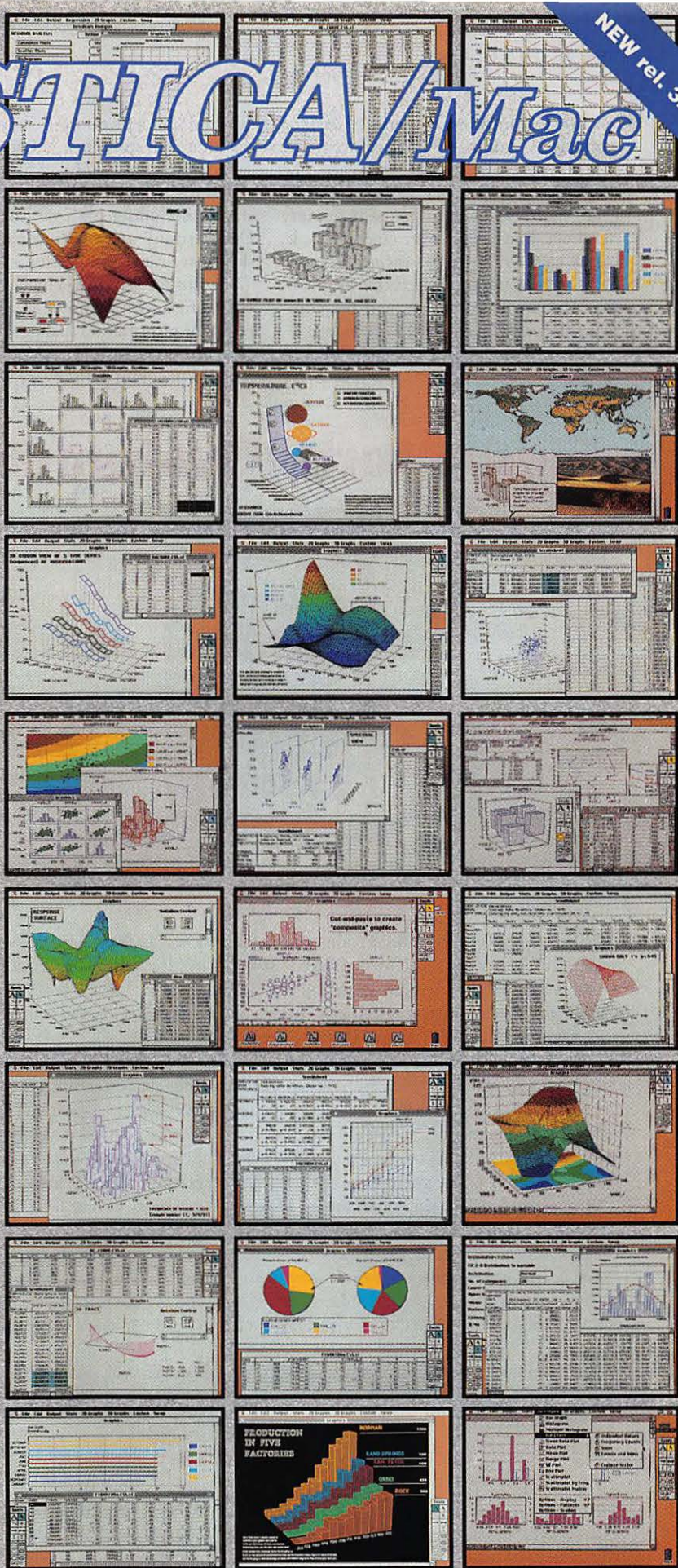
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Circle 99 on reader service card



Where on the Hard Drive Is Carmen Sandiego? Another game featuring the nefarious exploits of Ms. Sandiego. The sleuthing player pursues her gang through time, space, and the realm of imaginary numbers. Players discover clues by looking up facts in *The Joy of Cooking*, *Gravity's Rainbow*, the unexpurgated transcripts of the Warren Commission, and the complete *Encyclopedia Britannica* (included).

HyperHyperCard The 8-day-long installation process automatically links every

single document on your drive to every document in existence, all accessible by easy-to-use buttons. In addition, you can integrate all sorts of media into your stacks, including high-definition video, Dolby sound audio, Viewmaster slides, shortwave radio broadcasts, and Imax.

As an extra bonus, HyperHyperCard comes free with Danny Goodman's new personal information manager, Cradle to Grave. Though as simple to use as a Filofax, this program plans every waking mo-

ment of a user's life and triggers insulting dialog boxes when he or she veers from the established schedule. (Fortunately, the boxes seldom appear—more likely are the omnipresent "out of memory" messages.)

System 77 Last, but not least, Apple's new system software might take three hours to install, but it has everything, including the long-awaited Lose File feature for documents you'd rather forget. Balloon help has been expanded to accommodate brief QuickTime clips (hosted by Dick Cavett) explaining each feature as your cursor passes over it. And with a single keystroke, a special option allows you to place every one of your files and applications in the Apple menu. Imagine ease-of-use when *everything* is a desk accessory!

But don't take Apple at its word when it says "90MB minimum." With System 77 you'll need at least a gigabyte to run two applications. Another thing that Apple doesn't tell you is that System 77 is a tad, um, sluggish. How much so? Well, the video extension is called SlowTime. But Apple promises that 77.0.1 will solve the problem.

Same Old Same Old

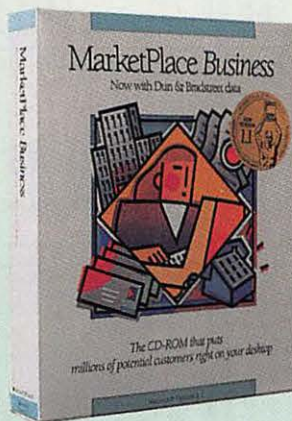
YOU GET THE IDEA. SOME PEOPLE, OF course, will say that my complaint is old and tired. That it is in the very nature of computers to have insufficient power, memory, and storage, and of course at any given point new software applications will challenge the limits of computation. All of this is very true. On the other hand, while it is old news that people shoot other people, this stale truth assumes new vitality when one is on the receiving end of a bullet.

More to the point, shouldn't we be getting close to the day when this curve of frustration will level off? While I can understand why voice-operated, character-recognition computers might need much more power and memory than our current models, the fact is that any word processor I use on the Mac is not a whole hell of a lot different than the one that first came with it when the machine had a small fraction of the memory, storage, and power that it does now.

Yes, it is true that our future computers will have gobs more memory, optical storage that will hold whole libraries of data, and microprocessor chips that will approach supercomputer warp speed. More memory, more storage, and more power. But mark my words—it won't be enough. Just wait until multimedia gets here. **m**

STEVEN LEVY's latest book is *Artificial Life* (Pantheon, 1992).

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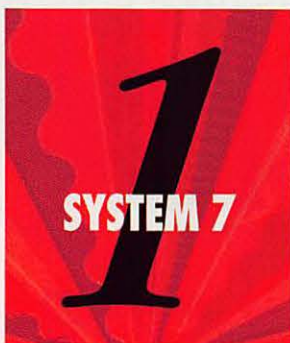


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7 REASONS WHY YOU NEED A NEW WORD PROCESSOR.



Because you're ready to see what System 7 can do.

Apple calls System 7 the biggest improvement in Macintosh since Macintosh. And WordPerfect® is now System 7 savvy.

So now (among lots of other new things), WordPerfect will automatically keep track of changes that you (or someone else) might make to imported files (charts, graphics, whatever), and update your WP documents accordingly. Now, a change made in one place can be a change made in many places. Apple calls it "Publish and Subscribe," and it works between programs on your hard drive, as well as among people on

your network. Publish and Subscribe assures you that your documents will always reflect the latest information available.

And it's just one of the new System 7 tricks that WordPerfect 2.1 has mastered.

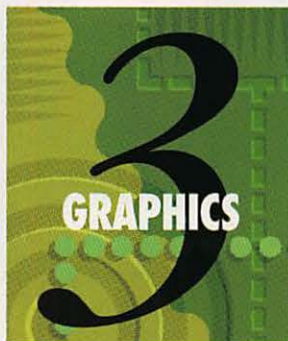


Because WordPerfect does columns better than the Greeks.

Pick a starting point, click on the ruler, and see your text in two columns. Or in three columns. Or five columns. With vertical rules beside or between them, if you like. Drag a guide on the ruler and try *unequal* columns. Highlight text in a box that jumps across columns.

Go crazy with the design, or stick with the tried-and-true.

The point is, WordPerfect gives you formatting options that other word processors don't. And exploring them couldn't be much easier.



Because you'd use more graphics if using them were easy.

WordPerfect not only gives you full control over the placement of graphics in your text, it also gives you a color drawing program for modifying imported artwork (or starting over from scratch) without ever leaving the program.

You can print graphics under your text (as "water-

marks") or on top (as overlays).

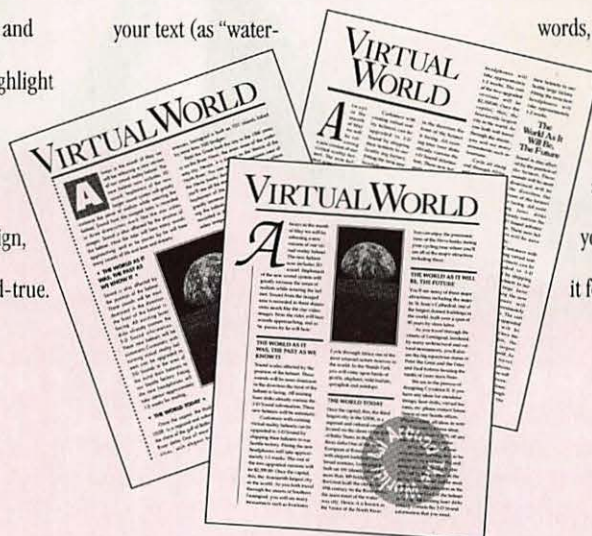
You can use the drawing tools to rotate text to any angle that strikes your fancy (something many page-layout programs still can't do).

And WordPerfect gives you 36 border styles and 64 fill patterns — which you can use in any of 256 colors — for highlighting graphics, paragraphs, columns, pages, even blocks of text.



Because a movie is worth who-knows-how-many words.

If a picture is worth a thousand words, what's a movie worth? With WordPerfect and QuickTime, you can calculate it for yourself.



Apple's QuickTime is a new technology that lets you work with digital video and sound as easily as you now work with text and graphics files.

Imagine being able to place (and size) a QuickTime movie anywhere in a document. You could add urgency to a memo with a few well-chosen words delivered "live." Or help an audience visualize your latest brainstorm with a 3-D simulation they can start, stop and replay.

We have a feeling that words can't begin to describe all the ways you'll think of to use it.



Because you get tired of repeating yourself, yourself, yourself.

Perhaps because they've heard it's a powerful programming

language, WordPerfect's macro editor intimidates some people at first. It shouldn't.

It's no more complicated than a tape recorder. Click "record" and it memorizes your keystrokes. Click "play" and it repeats them.

With no more knowledge than that, you can create a WordPerfect macro. And can spare yourself the effort of formatting M-E-M-O-R-A-N-D-U-M, T-o-; F-r-o-m: (and so on) across the top of the page every time you want to fire off a memo, for example.

But simple as recording your own macros can be, we also ship a number of them with the program. For formatting addresses to print on envelopes. Placing "drop caps" at the start of paragraphs. And other jobs you'd rather not do twice.



Because some people work on DOS computers.

You want the word processor that's right for you. If your choice happens also to be the choice of millions of others — with other computers — so much the better.

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WordPerfect's compatibility can save you a lot of aggravation. Not to mention a lot of reformatting.



Because even if you never call us, it's nice to know we're here.

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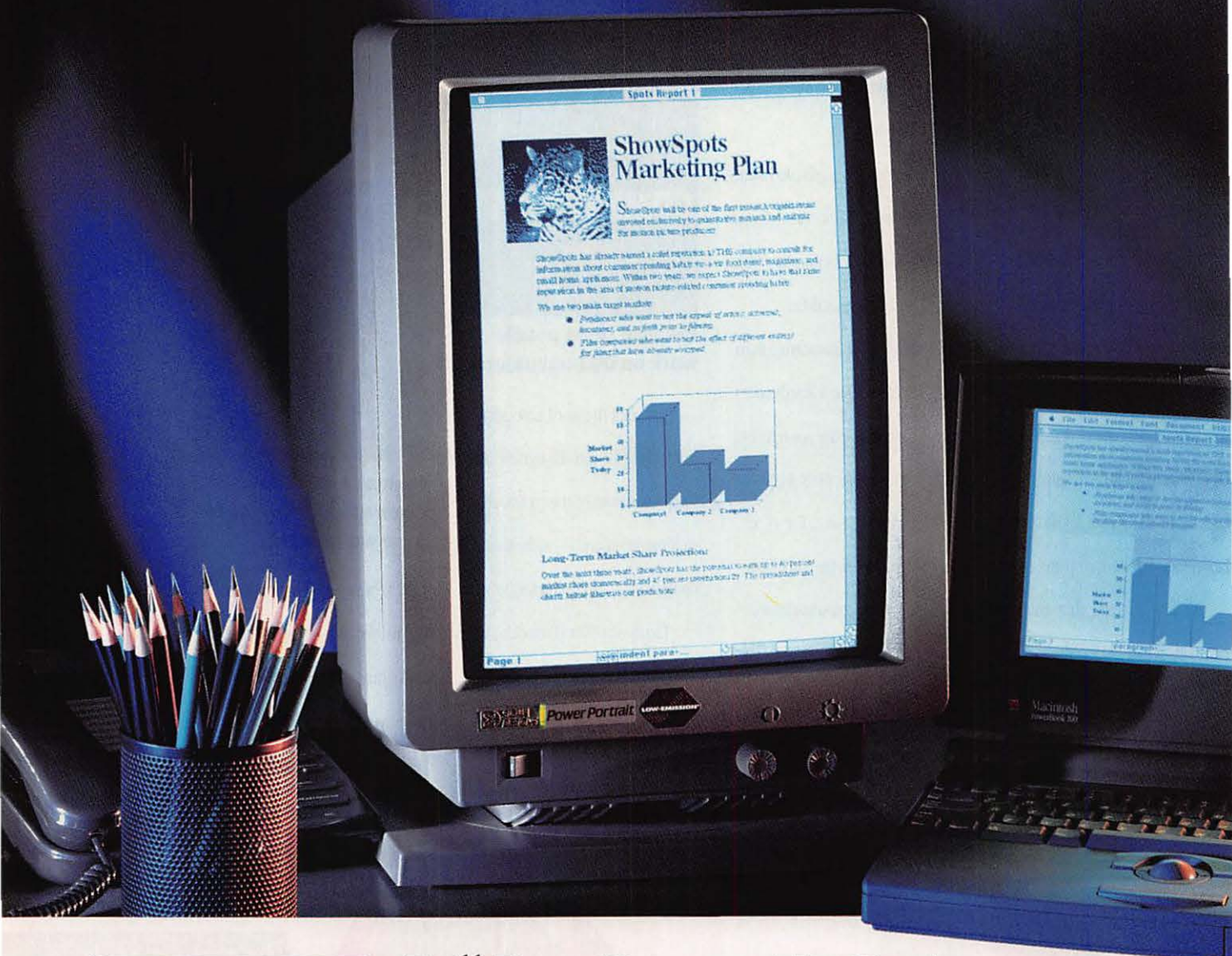
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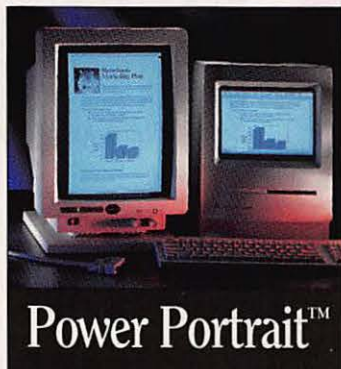
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Smart Company, Foolish Choices

BY DEBORAH BRANSCUM

PAUL CROUCH, JR., OWNS A video production company in Tustin, California. Mac Muehlman is a Macintosh user in Fairfield, Iowa. Both of them bought PowerBook 170s and both of them are angry about defective displays. Apple, you see, doesn't call them defective.

The active matrix technology used in PowerBook 170 displays is beautiful. It's also new, expensive, and imperfect. As a result, some displays have broken pixels. If a broken pixel is permanently black, Apple calls it a defect and repairs or replaces the display. If a broken pixel is permanently white, Apple calls it a voided pixel and says customers have to live with it—except under very narrow circumstances.

A consumer-law attorney I consulted disputes Apple's claim that it doesn't have to repair displays that have voided pixels. But before we get to that, let's consider the company's argument for its policy as outlined by Michelle Perata of Apple Executive Relations in a letter to one unhappy owner.

"Thank you for your recent letter to John Sculley regarding your new PowerBook 170 computer," she writes. "I understand that there are two pixel voids in the display of your PowerBook 170 computer, and that you are dissatisfied with Apple's decision not to replace this display.

"Some of the features that make active matrix display technology so superior are its fast refresh rate, sharp contrast, bright backlighting, and side-angle viewing ability. However, one less-appealing characteristic inherent in this technology is the appearance of pixel voids (pixels that stay white all the time).

"Apple's current manufacturing specifications for the Active Matrix Display allow the following: a) up to five voids that cannot appear within 1 inch of each other; b) zero defects (pixels that stay black all the time).

"Apple arrived at this specification because the manufacturing costs to eliminate all pixel voids would be prohibitive and would prevent Apple from making active matrix display technology available in the PowerBook 170 at an affordable price. At this time, Apple has no plans to

announce a service program for PowerBook 170 owners."

Apple's argument that the benefits of active matrix technology outweigh its flaws makes perfect sense—as long as customers are aware of Apple's policy before they buy and have a chance to decide for themselves if voided pixels are acceptable. But that's not what is happening.

Unhappy Customers

PAUL CROUCH, JR., FOR EXAMPLE, HAS spent about \$50,000 over the years on Macintosh equipment for his business. In March he unpacked a PowerBook 170 that had a trackball problem and three damaged pixels. His authorized Apple dealer was happy to fix the trackball, but unwilling to replace the display, since it wasn't broken in Apple's eyes. Crouch says a polite person on the Apple PowerBook repair hotline listened sympathetically but pointed out that the bad pixels represented a tiny failure rate in the overall scheme of things. That didn't comfort Crouch.

"It's like buying a Mercedes and having a big old ding in the door and having Mercedes say, Sorry, it's within factory specifications," he says. "If I had known about the situation, I would have fired up the machine and checked it on the spot. . . . I had no reason to expect the machine would be anything less than perfect." Although Apple sent a notice to its dealers about the policy, no one at the local computer dealership mentioned it to Crouch.

Mac Muehlman had a similar experience in April when he bought a PowerBook 170 that had one voided pixel. Muehlman purchased his 170 from an unauthorized dealer, a large mail-order company that initially refused to accept his PowerBook for a refund, then relented.

When Muehlman called Apple to discuss the issue, he was assured that Apple asks all its authorized dealers to tell customers about the pixel policy. So he called the local

authorized Apple dealer to inquire about the matter. According to Muehlman, a salesperson there said that he had never heard of a pixel policy until that moment. (An informal *Macworld* survey of eight dealers found that only two salespeople had heard of problems with active matrix technology.)

Are these guys a couple of whiners? Maybe, but I don't think so. Apple agrees that dead black pixels are defects. Voided pixels may be less obvious and aren't much of a problem at the edge of the screen, but a white pixel in the wrong place can be enormously irritating to some customers.

"One [bad] pixel is right dead center, so it doesn't matter if I'm working on text or a graphic, it's very annoying," explains Crouch. "It's like trying to read with a spot on your glasses. My eye goes right to it, so I usually have to reposition the windows so I don't see it. It drives me crazy—it's like having a fly on your nose."

Muehlman agrees. Looking at a 170 display with a voided pixel is like "looking at a Renoir painting with a hole in the canvas, he says."

Legally Speaking

MARK ANDERSON HAS A more-than-passing acquaintance with consumer law as a partner in the San Francisco law firm of Kemnitzer, Dickinson, Anderson & Barron. Last year he successfully represented a client who bought a defective PC clone system from a Los Angeles manufacturer that made three attempts to repair the system over the course of several months and failed miserably every time.

Eventually, the company refused to provide any additional warranty service. But the computer was still broken. Under California's Song-Beverly Consumer Warranty Act and the federal Magnuson Moss Warranty Act, Anderson demanded the company completely replace the system or reimburse his client for the purchase price, loss of use, re-

continues



*Apple claims it
doesn't
have to replace
PowerBook
displays that have
voided
pixels. Not so
fast, says
one attorney.*

sonable attorneys' fees, and some incidental expenses. The manufacturer said no. But the court said yes, and Anderson's client got her money back.

The PowerBook warranty states, in part, that Apple "warrants this hardware product against defects in materials and workmanship for a period of one year from the date of the original retail purchase. If you discover a defect, Apple will, at its option, repair, replace, or refund the purchase price of this product. . . ." I asked

Anderson to review copies of the PowerBook warranty and Michelle Perata's letter about the company's policy. Can Apple stand fast?

Probably not, according to Anderson. The company's policy that voided pixels do not require warranty repair "is probably not valid because no one has had notice before buying," says Anderson. "The question then is if it is a substantial defect. Would the average user care? Will it affect the use or value of the product? It

seems to me that a reasonable person shouldn't have to live with that defect." The more expensive the product, the higher the consumer's reasonable expectations, says Anderson. "I think a small-claims court would say, Apple, give 'em their money back."

It's not entirely that simple. Anderson points out that dealers and manufacturers are equally liable under the so-called lemon laws above, so consumers must attempt to negotiate with both parties before heading into court. But if that fails, look for an attorney. Or small-claims court may be an option, particularly in states like California, which sets a \$5000 limit on claims.

Smooth Moves

IT SEEMS SILLY, THOUGH, FOR THE few PowerBook owners disgruntled by the display issue to be forced into court when Apple has been so great in related areas.

Some PowerBook floppy drives have had real problems in reading 800K disks, for example. That's been solved with a Rev B mechanism, according to Apple. Customers with floppy drive problems can call the repair hotline (800/767-2775) and arrange for an Apple warranty repair or return the PowerBook to an authorized dealer for service.

Apple jumped to solve another problem as well. Spare nickel-cadmium batteries for PowerBook 140s and 170s may short-circuit if metal contacts both terminals. (It is an industry-wide problem, not an Apple problem.) That makes the batteries a potential fire hazard. Once Apple learned of the danger, it notified all its dealers, sent out a mailing to all registered PowerBook users, and established a toll-free number (800/377-4127) that users can call for a free protective battery case.

The very existence of the repair hotline has been a godsend for many users, who praise the pickup and delivery service for sick PowerBooks and Apple's fast repair turnaround. (These services will be available, for a price, after the warranty period as well.)

Winning Loyalty

IT SEEMS CLEAR THAT APPLE KNOWS how to do the right thing, it just doesn't want to—at least when it comes to the voided-pixel policy. The company has no plans for a service program, and no way to ensure that dealers publicize the active matrix trade-off to potential customers.

But that's not good enough. Active matrix technology is a step forward for users, and it's great that Apple is pushing to improve the technology and make it more widely available. But the company

continues



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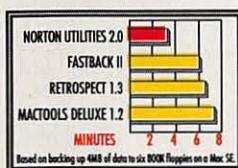
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must do a better job of informing consumers about the limitations of that technology before they get to the cash register. That may be tough with PowerBooks in such short supply that some dealers don't even display the machines, but it's not impossible.

Clothing manufacturers have an approach that might work for most Apple dealers. Fabrics made of natural fibers often have flaws. It's so common that some manufacturers hang tags on raw silk and

linen clothing pointing out the irregularities. Tags are an inexpensive way of informing customers about the nature of the fabric to avoid costly returns. Apple should insist that its dealers label display 170s in a similar fashion.

And once it does, Apple will discover that people are much more accepting of the limits of the technology—as long as they know about them upfront. As it is, Tim Hayes, director of service business for Apple USA, estimates that less than 3

Service Heroes

Alan Malkiel writes from Johannesburg, Sweden, to report on a good experience with Orchid Technology after returning his OrchidFax modem for a warranty repair. He asked for air-mail shipping because of the distance involved and included a check for the estimated shipping expenses. Orchid fixed the modem and sent it back via Federal Express second-day service. "My total downtime was less than three weeks—far less than I expected," writes Malkiel. "In addition, they sent a free copy of the latest software and returned my check. Finally, and most important in my opinion, they responded quickly to all my faxes."

In February, Ernest Thomas Cummins of Fort Lauderdale, Florida, turned to Dynamac for help with his Dynamac computer. Only problem was, the company went out of business last year. After reading that Micro Heaven of Denver was handling customer support, Cummins sent in his portable for repair—and had it back two days later. "Not only did Micro Heaven fix my problem (and for a very fair price), but they also cleaned my Dynamac and tuned it up so it's now running better than when I sent it," writes Cummins.

percent of PowerBook calls involve display questions or complaints. That's out of 200,000 PowerBooks sold in the first two quarters of this year, and not all of those were 170s. Given that, Apple can certainly afford to satisfy those few people unhappy with their 170 displays. After all, as Apple spokespeople keep telling me, nothing is more important to Apple than customer satisfaction.

Good thing, too, because I'm not sure Apple can afford to ignore disgruntled customers. Remember big spender Paul Crouch, Jr.? He tells everyone he meets about his pixel problem and tries to discourage them from buying a PowerBook.

Regardless of the law, practically and morally, Apple has an obligation to repair PowerBook 170 displays for the few people who will demand it. As attorney Anderson puts it, "They've got plenty of money for billboards, but they don't want to replace screens. That's not fair." **m**

Research assistance by CAROLYN BICKFORD.

Send nominees for sainthood to *Service Heroes*, Macworld, 501 Second St., San Francisco, CA 94107, or via AppleLink (Macworld1) or America Online (Branscum). Conversely, drop *Conspicuous Consumer* a line if a company is ignoring you.

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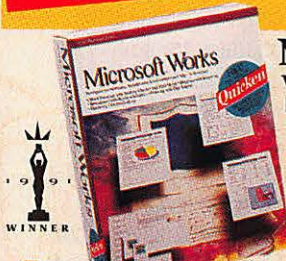
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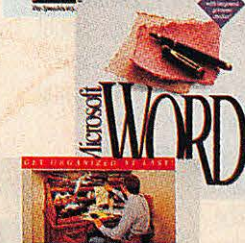
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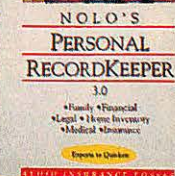
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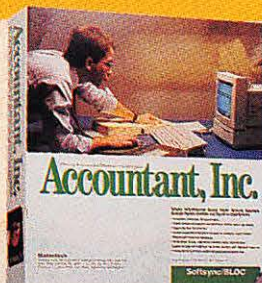
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05073 Expressionist 3.0	78

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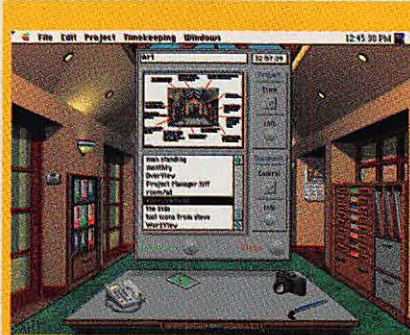
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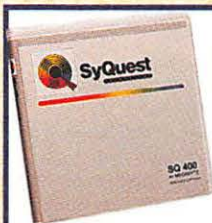
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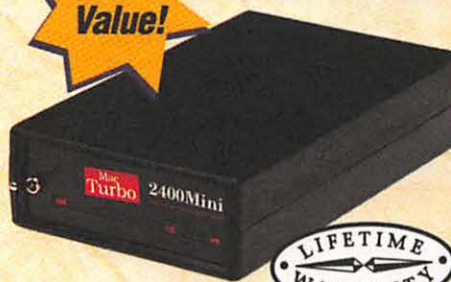
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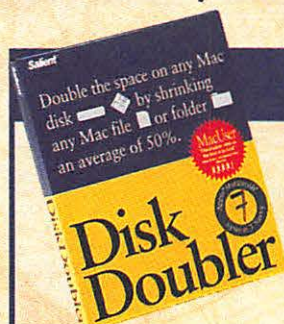
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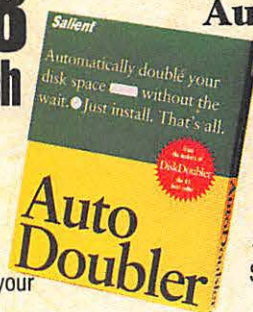
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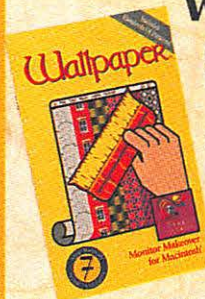


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04811 Empower II V4.07 148 ✓

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05046 Microcom Value Pak (MVP) 158 ⊙ ✓
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03515 Disk Doubler 3.7 48 ⊙ ✓

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04890 Norton Utilities 2.0 98 ⊙ ✓
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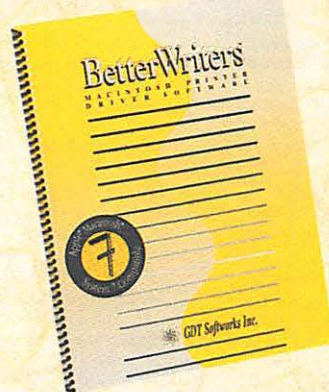
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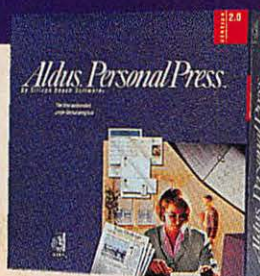
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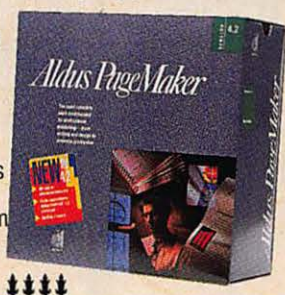
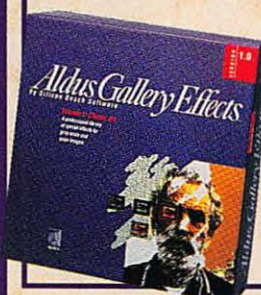
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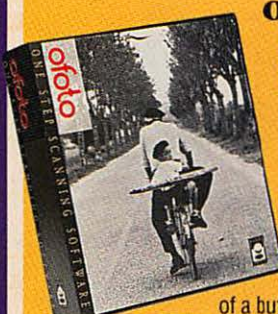


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Abracadaba	Design Your Own Home-(each)	62	✓
Adobe Systems			
04983	Adobe Illustrator 3.2 with ATM	364	✓
04042	PhotoShop 2.0	548	✓
03971	Streamline 2.0	121	✓
03497	Adobe Type Manager 2.0	58	✓
Aldus Corp.			
04121	Aldus Gallery Effects	128	✓
04573	Aldus Pagemaker V4.2	494	✓
04799	Personal Press	98	✓
00333	Aldus Freehand 3.1	394	✓
04190	Aldus Superpaint 3.0	132	✓
01379	Super 3D 2.5	324	✓
Bitstream			
05062	Type Essentials-Headlines	78	✓
05061	Type Essen.-Spreadsheets & Graphs 98	98	✓
05060	Type Essen.-Newsletters & Broch. 98	98	✓
05059	Type Essen.-Letters, Memos, & etc. 98	98	✓
Claris			
02201	MacPaint 2.0	84	✓
04073	MacDraw Pro	274	✓
Computer Associates			
04414	Crickit Draw III	199	✓
00803	Canvas 3.0	248	✓
DesignCad			
04180	Design Cad 2D/3D	159	✓
Electronic Arts			
03594	Studio 32	448	✓
Fractal Design			
00665	Fractal Design Painter V 2.0	248	✓
03216	Colorstudio	598	✓
Frame Technology			
03582	FrameMaker 3.0	594	✓
Light Source			
00657	Ofoto	279	✓
Quark			
04736	Quark Express 3.1	579	
Softsync, Inc.			
00954	Expert Color Paint	28	✓
Supernac Technology			
01576	Pixelpaint 2.1	148	✓
02665	Pixelpaint Pro 2.0	489	✓
TimeWorks			
04769	Publish It Easy 2.1	138	✓

MULTIMEDIA

Adobe, Systems			
04670	Adobe Premier	304	✓
CoSa			
00652	PaCo Producer for Windows	148	✓
00653	PaCo Producer for the Mac	148	✓
Diva			
00602	VideoShop	398	✓
Gold Disk Software			
03974	Animation Works	119	✓
Motion Works, Inc			
03985	Addmotion II	94	✓
01039	ProMotion with Primetime CD	248	✓
Macromedia			
00839	Director V3.0	688	✓
05018	Profess.QuickTime Authoring Kit	998	✓
05030	Getting Started QuickTime Kit	598	✓
03851	Macromind Media Maker	495	✓
04808	Swivelman 3D Pro 2.0	529	✓
04751	Magic	248	✓
03850	Filmmaker 2.0	439	✓
Pixar			
00030	Showplace / Macrenderman	548	✓
Raydream			
00441	RayDream Designer 2.0	619	✓
Specular International			
00815	Infini-D 3D Animator	646	✓
Strata			
04088	Stratavision 3D 2.5	628	✓



Getting Started Quicktime Kit

\$598 Quicktime Kit Here's a quick way to get started with QuickTime and save some cash in the process. You get Magic, MacRecorder Sound System Pro and Clip Media Volume 1—all for one incredibly low package price. Save \$600 off the price of purchasing each item separately! Macromedia #05030

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The Dest scanner combines full-page (8.5" wide), hand-held scanning and a 10-page automatic document feeder. Personal Scanner allows you to read almost any document into your computer for word processing or desktop publishing applications. Personal Scan comes as a kit that includes: 300dpi resolution scanner, cables and Recognize OCR Software! Dest #03929

#03930 ... Recognize OCR Software (if purchased separately).....\$575

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SCANNERS

Logitech

00513	Scan Pad	12	✓
00550	Trackman For Macintosh	84	✓
00670	ScanManMod1-w/Catchword	378	✓
02561	ScanManMod1 32-DigitDKRoom	295	✓

Marstek

01047	6000CS w/Photoshop LE	1298	✓
01050	3000CS w/Color It!	1098	
04592	Mac 800 Scanner	279	✓
04593	Langelo Color Artist	498	✓

Microtek

00369	Microtek 600Zs Color/Gray	1398	✓
00370	Microtek Scanmaker 1850S	1898	✓
04047	Microtek Truelaser Printer	1398	✓
04064	Microtek 600Gs	879	✓

Thunderware

00519	Lightning Scan Compact	289	
00520	Lightning Scan Pro Scanner	499	
01242	Thunderscan Plus	198	
01353	Thunderscan Mac II Pwr Supply	42	
02212	Lightning Scan 400	384	

Umax

00599	Umax 24 Bit UC 630 w/Photoshop ..	1389	
05314	Umax Transparent Opt.	737	

Wacom

00087	12X12 Static Surface 421 E	935	
03496	SD-510C 6X9 Tablet	560	
03677	SD-420E 12X12 Standard Surface	799	
03801	SD-422L 12 X 12 Tablet	875	
03802	SC-100 4 Button Cursor	120	
03803	SD-311E/12X18 Elect.Static Surf ..	1325	
03943	SP-310 Stylus (Soft)	99	
09771	SP200 2 Switch Cordless Stylus ..	65	
09772	SP-210 Cordless Stylus	65	

MONITORS & GRAPHICS

⊙ = System 7 Compatible ✓ = Money Back Guarantee

E-Machines

04151	Doublecolor LC/8Bit	399	✓
04152	Futura MX/24 Bit	1394	✓
04480	Doublecolor 8Bit	344	✓
04481	Futura EX/24 Bit	554	✓
04482	Futura SX/24 Bit	1044	✓
04483	Futura SX/8 Bit	694	✓
00874	Colorlink EX/T 1300-XLE	694	✓
00875	Colorlink SX/T 1324-XLE	1044	✓
00184	E Machines T19 19" Monitor	2624	✓
00876	Colorpage T16 II	1594	✓
04478	E Machines TX 16" Monitor	1775	✓
04105	Colorpage E16 16" Monitor	994	✓
04479	E Mach.Color Pg T16 16" mon. ...	1294	✓

Envisio

05165	Displ. Adapt./1MB f/pwrbk 100 ..	548	✓
05167	Displ. Adapt./1.0 f/pwrbk 140/170	638	✓

NEC

07143	Multisync 4FG 15" CLR Mon.	778	✓
07144	Multisync 3FGX 15" CLR Mon.	658	✓
07182	Multisync 6FG 21" CLR Mon.	3109	✓
07399	Multisync 5FG 17" CLR Mon.	1489	✓
00578	NEC MacFG 8X	798	✓
04985	NEC MacFG 24X	1598	✓

Radius

04437	Direct Color/GX Interface	554	✓
04488	Precision 8 Color Card	554	✓

Radius

04803	Precision Color 8X	798	✓
04804	Precision Color 24X	1798	✓
04205	Pivot Display Monochrome	764	✓
04206	Pivot Display Color	1298	✓
04350	TPD 21" Monochrome	1254	✓
04899	Precision Color 20" Dsply	2968	✓
04901	Powerview	539	✓

SuperMac

00613	Video Spigot NuBus	458	✓
00614	Video Spigot si	444	✓
05110	Video Spigot LC	444	✓
05111	Video Spigot Pro NuBus	1458	✓
05112	Video Spigot Pro si	1364	✓
05113	Spigot + Sound	820	✓
05114	Spigot + Sound Pro	1728	✓
05115	Spectrum 8 LC	534	✓
05116	Spectrum 8 Series III	534	✓
05117	Spectrum/24 Series III	1524	✓
05118	Spectrum 8/24 PDQ si	898	✓
05119	Spectrum 8/24 PDQ	898	✓
05120	Spectrum/24 Accelerator	454	✓
05121	Spectrum/24	1094	✓
05122	SuperMac Calibrator	544	✓
05123	Match 17" Multimode Color Mon.	1094	✓
05127	Match 20" Color Display	1798	✓
05125	Match 20" Dual-Mode Trinitron ..	2734	✓

UMAX UC630

Scanner w/ Photoshop

\$1389

Optional Slide Scanner pictured #05314.....\$737

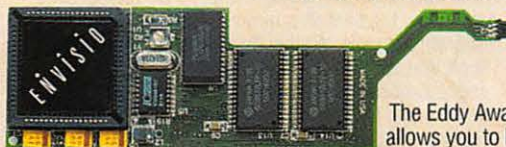


interface. UMAX Technologies #00599

State-of-the-art resolution and sharp, brilliant color, that's what the UMAX UC630 offers. It merges art with 600dpi high-resolution technology, so your pictures, photos and graphics can be reproduced on the screen with remarkable accuracy. The UC630 recognizes up to 16.8 million colors. And it's fast. It also features: an I/O buffer, image scanning modes, modular design and built-in SCSI

Powerbook Display Adaptor

\$548



The Eddy Award-winning Envisio Display Adaptor allows you to hook up your PowerBook to an external monitor. It supports all Apple and many VGA

displays via a lightweight, internally mounted video interface. Envisio, Inc. #05165 ✓ ✓

PowerBook Display Adapter 030 F/PB 140+170 #05167 ✓ ✓.....\$638

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Radius Precision Color 20" Display

\$2968

The Radius PrecisionColor Display/20 is a sophisticated, 20" Trinitron® color display for Macintosh and PC computers. The multi-frequency PrecisionColor Display/20 is microprocessor-controlled, connects to a wide array of video interface cards and gives users an unprecedented amount of control over image parameters. PrecisionColor's built-in microprocessor establishes sync with the interface card, provides the best image for the resolution and memorizes any user fine tuning. Radius #04899



Video Spigot

The VideoSpigot Digital Video Frame Grabber

\$458

is a revolutionary new digital video hardware/software system for making QuickTime movies with all NuBus-equipped Mac systems. This amazing system captures and digitizes NTSC/PAL video camera input at rates up to 30 frames per second with 24-bit color SuperMac Video Spigot for NuBus #00613



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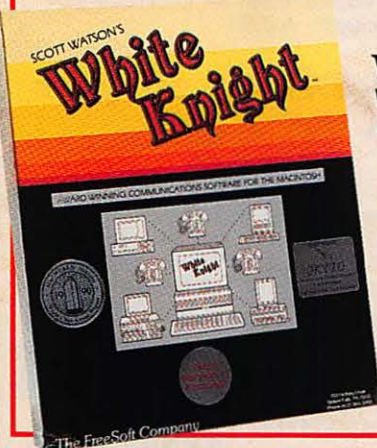
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MicroPhone II V.4.0 delivers communications without the hassle. Ideal for international telecommunications. Praised for ease of use and advanced scripting language, MicroPhone II 4.0 now contains faster script execution, screen speed, file transfers and new interface design tools. Supports ZMODEM transfer protocol and can operate modems at any speed from 50 to 57,600 baud. It includes predesigned front-ends that put you in touch with MCI Mail, CompuServe, Dow Jones, and other info services. Software Ventures #04893

\$209

COMMUNICATIONS SOFTWARE SOLUTIONS



White Knight 11

White Knight 11 (previously known as Red Ryder) has been called the best all-around telecommunications program available. Written by programming prodigy Scott Watson, White Knight 11 gives you technical sophistication, flexibility and user-friendliness... at a great price. Its features include: a full-featured BBS package, a text log, security and access restriction, file transfers, message sections, a powerful scripting language, gateway functions, technical support and more. Freesoft #02881

\$84



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Xeba 24/96 S/R Fax Modem With V.42bis

You will not find a 9600 send/receive Fax Modem at a better price.

The V.42bis offers multiple transfer speeds and is available in black or gray. Includes Mac cable. Comes with QuickLink II data communications software and STF fax software. Logicode Technology, Inc. #04644 black, platinum #04664

\$199

Quicktel Xeba 2400bps Data Modem

\$99

With the Quicktel Xeba 2400bps Modem you get unique styling and rock-solid engineering at a great price. It features multiple positions and icons and comes with everything you need to get up and running. The package includes data communications software and cable. Works with Mac plus and up machines. Logicode #00852

COMMUNICATIONS

Century	
04308 Century Term for Mac	124 ✓
Compuserve	
00213 Compuserve Mac Membership Kit	28 ✓
00564 Compuserve Navigator 3.1	48 ✓
00813 Compuserve Almanac	9 ✓
Freesoft Company	
02881 White Knight II	84 ✓
04770 Second Sight 2.1	85 ✓
Hayes	
04497 Smartcomm II V.3.3	83 ✓
05028 Hayes Connect Software for Mac	88 ✓
Prometheus	
02849 Prometheus MacKnowledge	84 ✓
Synergy Software	
00674 Versa Term Pro v 3.6	178 ✓
05022 Versa Term v 4.6	87 ✓
Software Ventures	
04893 Microphone II 4.0	209 ✓
White Pine Software	
03487 Mac 241 v 3.2	199 ✓

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MODEMS & FAXES

Applied Engineering

03666 Modem 2400 MNP 5 External	195 ✓
03667 Modem 2400 MNP 5 Send Fax Extl	235 ✓
03668 Modem 2400 MNP 5 Internal	195 ✓
03669 Modem 2400 MNP 5 Send Fax Inter	269 ✓
03980 Mac LC 24/96 Sendfax Modem	245 ✓
04579 Datalink LC V.42 Fax/Modem	259 ✓

Best Data

00698 Smart One 2400 Mac Modem	110
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Hayes

00451 Hayes Personal Modem 2400+	148 ✓
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Hayes

04796 Hayes Ultra9600 w/Smartcom IIMac698	✓
04497 Smartcom II 3.3	83 ✓
07829 Hayes Optima 24/SC EZ	158 ✓
09936 Hayes Optima 96.32 w/Sc Ez	515 ✓

Logicode Technology

00852 Xeba 2400 Ext	99
04644 Xeba 9600S/R Fax/V.42Bis Black	199 ✓
04674 Xeba 9600S/R Fax/V.42Bis Platn	199 ✓

Mass Microsystems

00701 24/96 Fax Modem	179
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MacTurbo

00408 MacTurbo Plus Modem	89 ✓
00977 MacTurbo 24/96 Fax Modem	149 ✓

Prometheus

00062 Promodem Ultima	634 ✓
00331 PowerBook Home Office Int 24/96269	✓
00877 Home Office Ultima Ext	498
00907 Home Office 24/96 w/Voice	269
03312 Promodem 2400 Mini-M	118 ✓
03313 Promodem Travel Modem	122 ✓
03608 Promodem 9600M Plus	599 ✓
04416 Prometheus 2400 Mini Plus	123 ✓
04596 Promodem 2496 S/R Mini Fax+	268 ✓

PSI Integration, Inc.

04948 PSI Powermodem 24/96SR Internal	215 ✓
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Shiva

01615 Shiva Netmodem V2400	338 ✓
03251 Shiva Netmodem V.32 9600	1149 ✓
04129 Shiva Netmodem/E 10 BaSE T	1749 ✓
04491 Shiva Netmodem E Thin/Bnc	1749 ✓
04758 Shiva Netmodem/E Thick	1749 ✓
04759 Shiva Netmodem/E AUI	1749 ✓
05128 Shiva LanRover/L	628 ✓

Supra Corporation

00065 Supra Modem 2400 Plus	148 ✓
00413 Supra Fax Mod. V.32BIS wstf/cbl	379 ✓
00414 Sup Fax Modem V.32BIS w/o stf/cbl	319 ✓
00424 Supra Fax Modem V.32 w/o stf/cbl	259 ✓
00426 Supra Fax Modem V.32 wstf/cbl	329 ✓
02003 Supra Modem 2400 Baud	89 ✓
03368 Supra Modem 2400 Macpac	138 ✓
04351 Supra Fax Modem Plus	199 ✓

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speed of the standard SE. The board comes standard with a 68882 Floating Point Unit (FPU) math chip which greatly enhances the speed of any math functions, so your spreadsheets and CAD programs run faster than ever before. Applied Engineering #04325



NEW FARALLON ETHERNET PRODUCTS

A complete line of Ethernet Cards for anymac slot. And any media including new 3-way adapters with thick, thin and 10 BASE-T ports.

Cards starting at **\$158**

See Farallon line listings for complete selection.

AE Plus Drive \$308

The new 1.44Mb floppy "plus drive" is one of the finest drives available for the Mac. Some of its many features include: SuperDrive capability with the Mac Plus, SE and Mac II family; MS-DOS compatibility; two color read/write activity light; auto, touch & paper clip eject; die cast Apple "platinum" case; and the manufacturer's full one-year warranty. Applied Engineering #04956



ACCELERATORS

w/▶ = FPU Included ▶ = also available w/ FPU

Applied Engineering

00289	Cache-In (Ilii Cache Card)	194	✓
00833	QuickSilver Ilii Cache Card	269	✓
00873	TransWarp 040	2189	✓
03673	Quadralink	208	✓
04072	Cache In 50 w/▶	1899	✓
04120	Fast Math LC	139	✓
04325	TransWarp SE Accel 25MHz w/▶	798	✓
04732	TransWarp LC 33MHz w/▶	998	✓
04735	TransWarp SE 40 MHz w/▶	1499	✓
04903	TransWarp LC 33MHz	799	✓
04904	Fastmath Classic II	139	✓
04732	TransWarp LC 33MHz	998	✓
04904	Fastmath Classic II	139	✓

DayStar Digital

00560	Equalizer LC Virtual Mem Upgr	259	✓
05003	Power Math LC	118	✓
00561	Fast Cache 040 f/Quadra700/900	374	✓
03729	SCSI Powercard with out Simms	1124	✓
03730	Ram Powercard with out Simms	499	✓
04181	Fast Cache Ilii	309	✓
05004	Combo Cache II si w/▶	334	✓
05005	Combo Cache Ilii	258	✓
00562	Fast Cache PDS/si Fpu+ Adpt	394	✓
05006	Fast Cache Ilii (32k)	184	✓
02877	Fast Cache Ilii 64K Ram	278	✓
04323	Universal Powercache 33 MHz	643	✓
04319	Universal Powercache 40MHz	868	✓
04321	Universal Powercache 50 MHz	1348	✓

Powercaches must be purchased w/adpt
Powercache adapters

Cache Adapter LC, si, Ilii	38	✓
Cache Adapter PDS (SE/30), Ilii	38	✓

NewLife Computer Corporation

04914	NewLife 16MHz ▶ Plus & 512E	499	✓
04915	NewLife 16MHz w/FPU+ & 512E	579	✓
04917	"NewLife SCSI for 128K, 512K, 512KE"	98	✓
04918	NewLife 16MHz w/▶ (SE)	479	✓



Universal PowerCache Accelerators

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\$648

The award-winning PowerCache gives you the best combination of blazing-fast speeds (up to three times faster) and cost-effective prices. More importantly, the PowerCache is guaranteed 100% compatible with ALL your software and hardware. The same board fits seven different Macs (adapter required for non-Ilii installations).



DaynaSTAR MiniHub

\$242

The DaynaSTAR MiniHub is a non-intelligent hub for connecting network devices using twisted-pair (10BASE-T) Ethernet wiring and allowing communication between various types of computers, printers and servers. Dayna Communications, Inc. #04911

Asante

00006	Asante F/Powerbooks 10 BaseT	329	✓
00020	Maccon + 30IE	198	✓
00221	Maccon+Ile w/64K Ram	259	✓
00228	Maccon + 30 IET 64	259	✓
00327	EN/SC SCSI Ethernet	339	✓
00347	Person to Person 10pk	279	✓
00348	10 T Hub/12	560	✓
00402	Person to Person Zonepk	490	✓
00404	10T Hub/8	280	✓
00407	Person to Person 2 Pack	102	✓
00510	Maccon 3 SE	249	✓
00511	Maccon 3 NuBus 64K	249	✓
00820	Maccon + 30 IE MC 64	359	✓
03641	Maccon + II E EN	199	✓
03642	Maccon + II ET 64K Ram	254	✓
03646	Maccon+ 30 I ET	199	✓
03647	Maccon+30ie 64	269	✓
03945	10T MAU	98	✓
04184	Maccon + 30 I ET MC64	249	✓
04334	Maccon+ 30 I ET MC	299	✓
04933	Maccon 3 Ilii	249	✓

Dayna Communications Inc

00003	Dayna Etherprint 10T	342	✓
00321	EtherPrint Plus 4 Devices	615	✓
00322	EtherPrint-T Plus 4 Devices	615	✓
00485	DaynaPort SCSI Link/Thin	272	✓
00487	DaynaPort SCSI Link-T	272	✓
00488	DaynaPort SCSI Link-3	299	✓
00804	DaynaPort E/Z	264	✓
00805	DaynaPort E/Si	148	✓
00806	DaynaPort E/LC	148	✓
03546	Dayna Etherport/Local Talk	348	✓
04139	DaynaPort E/Z T	264	✓
04297	Dayna DI2000 Single User	204	✓
04595	DaynaPort E/II-T	148	✓
04717	Daynaport E/30	148	✓
04718	Daynaport E/II	148	✓
04911	DaynaStar Minihub	242	✓
05184	NetMouter Single User	54	✓
05185	NetMouter 5 User	224	✓
05186	NetMouter 10 user	334	✓
05188	DaynaPort SCSI/Link PB	294	✓
05189	DaynaPort SCSI/Link T PB	294	✓
05190	DaynaPort SCSI/Link 3 PB	338	✓
05191	DaynaSTAR Hub-12	684	✓

Farallon

00137	EN SI/SE30 10Pk PN587	1759	✓
00139	EN SI/SE30 Card/PN585	179	✓
00352	Phononet Talk Appleshare	124	✓
00353	Phononet Card Pc Loc.Ilii PN380	208	✓
00676	EtherMac II-TN	158	✓
00677	EtherMac II-10T	158	✓
00678	EtherMac II-C	214	✓
00679	EtherMac LC-TN	158	✓
00680	EtherMac LC-TN + FPU	258	✓
00681	EtherMac LC-10T	158	✓
00682	EtherMac LC-10T+FPU	258	✓
00683	EtherMac LC-C	214	✓
00684	EtherMac LC-C+FPU	308	✓
00685	EtherMac 30i-TN	194	✓
00686	EtherMac 30i-TN+FPU	288	✓
00691	EtherMac 30i-10T	194	✓
00692	EtherMac 30i-10T+FPU	288	✓
00693	EtherMac 30i-C	244	✓
00695	EtherMac 30i-C+FPU	344	✓
00696	EtherMac SE-C	214	✓
00829	StarController 300 Ser. PN307	886	✓
03333	StarController En PN 507	1358	✓
03475	StarConnector En PN 501	102	✓
04307	Phone Net StarConnect. PN502	104	✓
04738	12 Port StarController PN357	1024	✓
04739	24 Port StarController PN377-1	1298	✓
04885	Timbuktu Power Pack	128	✓

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Video Training Becoming Most Popular, Least Expensive Way to Learn Macintosh Programs

*Macintosh Programs Can Now Be Learned in a Few Hours With A
Unique MacAcademy Video Speed Learning System*

Over the past five years I've been associated with over 100,000 people attempting to learn the Macintosh computer. I've watched as each one waged their own personal, private battle trying to master the Mac and the most popular Macintosh programs.

I've felt their frustration, have empathized with their confusion and have understood their computer fears. I've talked to employees who had new computers and new programs dropped on their desk with the directive to "learn this." I've listened to people who struggled night after night trying to read and understand a computer manual. It's amazing how a computer manual can make a fairly bright person feel totally inept.

You'd be surprised at the number of people who have confided in me the fact they've given up trying to learn some of the programs. They've put the box on the shelf and simply written the expenditure off as a bad investment.

Hard Earned Money Wasted

Can you imagine how much money has been wasted on programs and computers that are sitting abandoned? Right now think of the people working on Macs in your office. Do they really understand the computer? How many programs are each of your people using? Have they really mastered the programs? Do they know the shortcuts and valuable techniques that will save you time, money and increase your professionalism?

An Excellent, Low Cost Training Answer

Five years ago I founded MacAcademy. My purpose was to create a training organization that provided training similar in nature to the Macintosh itself - simple, easy to use and effective.

Now, five years later the concept has proven to be a great success. Right now people are benefiting from MacAcademy training in over 100 cities in the U.S., in Canada, Great Britain, Australia, Japan, Hong Kong and 22 additional countries throughout the world.

MacAcademy training is successful for one reason - it works!

The Video Answer

Three years ago we introduced the MacAcademy Video Training Library. This library now includes over 80 different titles. Each video is 2 hours long and offers clear, concise, effective training. In some cases you can receive up to 8 hours of training for one program.

MacAcademy has resisted the temptation to follow competitive training programs who have recently implemented large price increases. Our videos started out at \$49 each and are still only \$49. This low cost training alternative has proven to be the Macintosh training choice of over 10,000 companies.

Guaranteed Results
The MacAcademy reputation is excellent. Our guarantee is simple: If you're not happy we'll refund your money. No hassles or problems.

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Here is a partial list of over 80 MacAcademy Video training tapes now available. To order, simply send check, credit card information, or purchase order to MacAcademy Videos Dept. MW792 477 S. Nova Rd. Ormond Beach, FL 32174 or call the numbers listed below. Now is the time to start training. Thank you for allowing MacAcademy to help you in that effort.

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Excel 3.0 Part 3	<input type="checkbox"/>
Excel 3.0 Part 4	<input type="checkbox"/>
FileMaker Pro Part 1	<input type="checkbox"/>
FileMaker Pro Part 2	<input type="checkbox"/>
FileMaker Pro Part 3	<input type="checkbox"/>
Freehand 3.0 Part 1	<input type="checkbox"/>
Freehand 3.0 Part 2	<input type="checkbox"/>
Freehand 3.0 Part 3	<input type="checkbox"/>
Font Management	<input type="checkbox"/>
HyperCard Basics Part 1	<input type="checkbox"/>
HyperCard HyperTalk Part 2	<input type="checkbox"/>
HyperCard HyperTalk Part 3	<input type="checkbox"/>
Lotus 1-2-3 Part 1	<input type="checkbox"/>
Lotus 1-2-3 Part 2	<input type="checkbox"/>
Lotus 1-2-3 Part 3	<input type="checkbox"/>
Lotus 1-2-3 Part 4	<input type="checkbox"/>
MacDraw Pro Part 1	<input type="checkbox"/>
MacDraw Pro Part 2	<input type="checkbox"/>
Macintosh Networks	<input type="checkbox"/>
MacProject II Part 1	<input type="checkbox"/>
MacProject II Part 2	<input type="checkbox"/>
MacWrite II Part 1	<input type="checkbox"/>
MacWrite II Part 2	<input type="checkbox"/>
Microsoft Word 5.0 Part 1	<input type="checkbox"/>
Microsoft Word 5.0 Part 2	<input type="checkbox"/>
Microsoft Word 5.0 Part 3	<input type="checkbox"/>
Microsoft Word 5.0 Part 4	<input type="checkbox"/>
PageMaker 4.2 Part 1	<input type="checkbox"/>
PageMaker 4.2 Part 2	<input type="checkbox"/>
PageMaker 4.2 Part 3	<input type="checkbox"/>
PageMaker 4.2 Part 4	<input type="checkbox"/>
Paints & Draws	<input type="checkbox"/>
Persuasion Part 1	<input type="checkbox"/>
Persuasion Part 2	<input type="checkbox"/>
PowerPoint	<input type="checkbox"/>
QuarkXPress 3.1 Part 1	<input type="checkbox"/>
QuarkXPress 3.1 Part 2	<input type="checkbox"/>
QuarkXPress 3.1 Part 3	<input type="checkbox"/>
Quicken 3.0	<input type="checkbox"/>
SuperPaint Part 1	<input type="checkbox"/>
SuperPaint Part 2	<input type="checkbox"/>
SuperPaint Part 3	<input type="checkbox"/>
The Macintosh Part 1 (6.0+)	<input type="checkbox"/>
The Macintosh Part 2 (6.0+)	<input type="checkbox"/>
The Macintosh Part 3 (6.0+)	<input type="checkbox"/>
The Macintosh Part 1 (7.0)	<input type="checkbox"/>
The Macintosh Part 2 (7.0)	<input type="checkbox"/>
The Macintosh Part 3 (7.0)	<input type="checkbox"/>
Using System 7	<input type="checkbox"/>

National Strength

With Personal Understanding

Updates

JULY 1992

THIS SECTION LISTS
THE LATEST VERSIONS OF SELECTED
MAC APPLICATIONS
THAT WERE SHIPPING BY THE TIME
WE WENT TO PRESS.

PRODUCT	V.	REQ.	*	\$
4TH DIMENSION	2.2	1MB/6.0		\$99
A4	3.0	2MB/6.0.5		\$395
ACCOUNTANT, INC. PROFESSIONAL	3.0	1MB/6.0.3		*
ACCUTEXT	3.0	4MB/6.0		\$150
ACTA 7	7.0	512KE/6.0.5	2/92	\$33.50
ADDIMOTION	2.0	2MB/6.0.5		*
ADDRESS BOOK PLUS	2.0	1MB/6.0.2	2/92	\$25
ADOBE ILLUSTRATOR	3.2	2MB/6.0.3		*
ADOBE PHOTOSHOP	2.0.1	2MB/6.0.2	9/91	\$199
ADOBE TYPE MANAGER	2.0	1MB/6.0.2		FREE
AFTER DARK	2.0	512KE/4.1		*
AGENT DA	2.0	1MB/6.0.5		\$30
AGFATYPE	3.0	2MB/6.0.2		FREE
AGFA TYPECHART	1.5	1MB/6.0.4		FREE
ALARMING EVENTS	1.0.3	1MB/6.0.2		\$15
ALDUS DIGITAL DARKROOM	2.0	1MB/6.0	9/91	*
ALDUS FREEHAND	3.1	1MB/6.0.5	6/92	*
ALDUS Pagemaker	4.2	4MB/6.0.5	5/92	*
ALDUS PERSUASION	2.1	4MB/6.0.5		*
ALDUS SUPER 3D	2.5	2MB/6.0.5		*
ALDUS SUPERCARD	1.6	2MB/6.0.4		\$50
ALDUS SUPERPAINT	3.0	1MB/6.0.5	3/92	\$65
ALLIANCE POWER TOOLS	2	1MB/6.0.4		*
AMAZING PAINT	1.0.1	512KE/6.0.4		\$15
AME	2.0	1MB/6.0.2		\$49.95
ANTITOXIN	2.0	1MB/6.0		\$15
APPLESHARE FILE SERVER	2.0	512K/3.2		*
ARCHICAD	4.03	5MB/6.0	6/92 10% OF LIST	
ASHLAR VELLUM	2.10	4MB/6.0.2		*
ASHLAR VELLUM 3D	2.10	4MB/6.0.2		*
ATONCE	1.2	1MB/6.0.5		*
AUDIOMEDIA	2.02	2MB/6.0.7		\$29
AURACAD	3.01	1MB/4.0		\$90
AUTHORWARE PRO	1.7	2MB/6.0.5		*
AUTOSAVE II	2.0	512KE/4.2		*
A/UX	2.0	4MB/6.0.5		*
AZIMUTH	2.1	1MB/6.0.2		\$45
BACKFAX	2.0	1MB/6.0.3		\$75

PRODUCT	V.	REQ.	*	\$
BACKMATIC	2.0	1MB/4.2	2/92	*
BILL-IT	4.0	1MB/6.0.3		\$29
BITSTREAM TYPEFACE LIBRARY	1.5	1MB/6.0		*
BUSINESS SENSE	1.5	1MB/6.0.7		\$69
CA-CRICKET PRESENTS	2.0.1	1MB/6.0		*
CALENDAR	1.1.2	512KE/6.0		FREE
CANOPENER	2.0	512K/3.0		\$29
CANVAS	3.0	1MB/6.0.2	1/92	*
CAPTURE	4.0	1MB/6.0		\$30
CARBON COPY MAC	2.0	1MB/6.0.5	4/92	*
CAT III	1.1	1MB/6.0		*
CHECKLIST	2.0	1MB/6.0	2/92	*
CINEMATION	1.0	4MB/6.07	7/92	NA
CLARIS CAD	2.0.2	2MB/6.0		\$79
CLARIS RESOLVE	1.0.1	1MB/6.0.5	1/92	NA
CLARISWORKS	1.0	1MB/6.0.5	3/92	NA
CLICKCHANGE	1.05.2	1MB/6.0.4		\$5
CLICKPASTE	2.1	1MB/6.0		\$20
CMS UTILITIES	7.0	2MB/7.0		\$25
COLOR MACCHEESE	2.07	1MB/6.0.5		\$15
COLORSTUDIO	1.5	4MB/6.0.5	3/92	*
COMPUSERVE INFORMATION MANAGER	1.5	1MB/4.1		*
COMPUSERVE NAVIGATOR	3.1	512K/4.1		*
CONCERTWARE+	4.0	512KE/4.2		\$15
CONNECTIONS	2.0	2MB/6.0.5	4/92	NA
CORRECT GRAMMAR	3.0	1MB/4.2		\$29.95
DATA CLUB CLASSIC	2.0	2MB/6.0		*
DATA SHAPER	1.2	1MB/6.0		\$40
DECK	1.03	2MB/6.0.7		FREE
DELTA GRAPH PROFESSIONAL	2.0	2MB/6.0.5	5/92	\$69.95
DELUXEMUSIC CONSTRUCTION SET	2.5	512K/6.0.2		*
DESCARTES	1.04	2MB/6.0.3		FREE
D.E.S. DOCUMENT EXCHANGE SYSTEM	4.1	1MB/6.0		*
DESIGNCAD	3.0	2MB/6.0.5		*
DESIGNCAD 2D/3D	3.0	2MB/6.0.5		\$50
DESIGNSTUDIO	2.0	1MB/6.0	11/91	*
DESKPAINT	3.07	1MB/6.0.5		\$19.95
DIGITAL DARKROOM	2.0	1MB/6.0.4	9/91	\$80
DISKDOUBLER	3.7	1MB/6.0.2		\$15
DISKEXPRESS II	2.10	1MB/6.0		FREE
DISKFIT PRO	1.0	1MB/6.0	4/92	\$32.50
DISKTOP	4.01	1MB/6.0		*

continues

V. = version #. Req. = min. RAM and system software required. * = last time (in the past year) this or an earlier version was reviewed. \$ = cost of update to registered owners. NA = first version, not applicable. * = contact your dealer for update policy. Blue = new version. Yellow = reviewed product.

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• DayMaker personal organizer software: Gives you the power to organize your work and life. Control over information and time. Exclusive "tag" system lets you define your own categories, then view and print customized lists and calendars that perfectly match your needs.

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MacWeek

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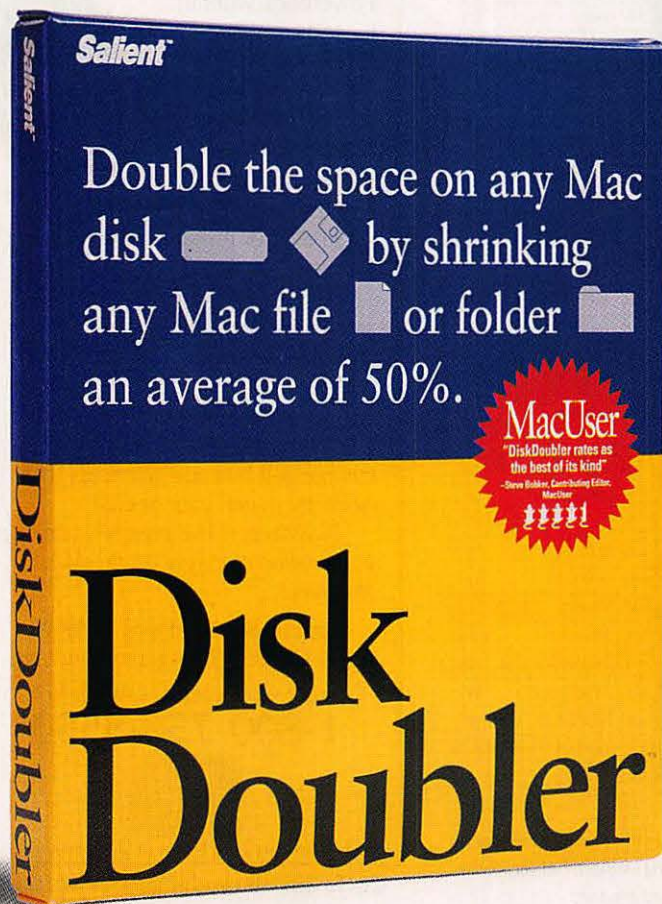
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Circle 269 on reader service card

PRODUCT	V.	REQ.	*	S
DISPLAY ADBUILDER	1.1	1MB/6.0.3	*	
DOLLARS & SENSE	5.0	512K/3.2	*	
DOUBLE HELIX	3.5	1MB/6.0		\$99
DREAMS	1.1	1MB/6.0.2	*	
DYNAPERSPECTIVE	2.3	2MB/6.0.5		\$149
DYNODEX	2.0	1MB/6.0	2/92	\$25
EASY COLOR PAINT	2.02	1MB/6.0.2	*	
EHELP	2.0	1MB/4.1		\$445
EMPOWER II	4.0.7	2MB/4.2	*	
ENCORE	2.5	2MB/6.0.2	*	
ENHANCE	2.0	2MB/6.0.3	11/91	\$100
EVOLVE	1.1	2MB/5.3		\$25
EXODUS	3.0.2	2MB/6.0.3		\$50
EZ VISION	1.0	1MB/6.0.3	NA	
FASTBACK PLUS	2.6	1MB/6.0	4/92	*
FAST FORMS	2.0	1MB/6.0		\$25
FASTLABEL	3.1	1MB/6.0		\$10
FASTTRACK	1.5	512K/5.5		\$20
FILEGUARD	2.7	1MB/4.2		\$18
FILEMAKER PRO	1.02	1MB/4.2		FREE
FILEVISION V	1.1	1MB/6.0.2	*	
FILMMAKER	2.5	5MB/6.0.3	*	
FINALE	2.6	1MB/6.0.2		FREE
FLEXICAD	2.20	5MB/6.0.4	*	
FONTMONGER	1.0.5	2MB/6.0.2	10/91	FREE
FONTGRAPHER	3.5	1MB/4.2	*	
FONTSHARE	2.2	1MB/6.0		FREE
FONTSTUDIO	2.0	1MB/6.0.5	*	
FORM Z	2.0	2MB/6.0	*	
FOXBASE+/MAC	2.01	1MB/6.0		FREE
FRAMEMAKER	3.0	1MB/6.0	3/92	*

PRODUCT	V.	REQ.	*	S
FREEDOM OF PRESS LIGHT	3.0.3	2MB/6.0.3		\$25
FREEDOM OF PRESS PROFESSIONAL	3.0.2A	4MB/6.0.3		\$250
FULL IMPACT	2.0	1MB/6.0		\$50
FULLWRITE PROFESSIONAL	1.5	2MB/6.0.2	*	
GENERIC CADD	1.1	1MB/6.0.5	*	
GEOQUERY	3.0	1MB/6.0	*	
GOFER	2.0	1MB/4.1	6/92	\$25
GRACELAN	2.0	1MB/6.0.5	*	
GRACELAN UPDATE MANAGER	1.0	2MB/6.0.5	NA	
GRAMMATIK MAC	2.05	1MB/6.0		\$15
GREAT GANTT	1.4	1MB/6.0	*	
GREAT PLAINS ACCOUNTING SERIES	6.0	1MB/4.2	*	
GREATWORKS	1.0	1MB/6.0.2	1/92	NA
GUIDE	2.0	512K/4.1		\$50
HAND-OFF II	2.2.5	2MB/6.0.2		FREE
HELP	1.0.1	1MB/6.0	2/92	FREE
HYPERCARD	2.1	1MB/6.0.3		\$49
HYPERDA	2.0	512K/3.2	*	
ICON-IT	2.1	1MB/6.0.2	*	
IF:X FORMS DESIGNER	1.1	1MB/6.0		FREE
IGOR	1.2	2MB/4.1		\$35
IMAGE GRABBER	3.0	1MB/6.0	2/92	\$18
IMAGESTUDIO	1.7	1MB/6.0		\$99
INFINI-D	1.1	4MB/6.0.4	9/91	FREE
INFOLOGIC ENVELOPE	1.1C	512K/4.0		\$5
INITPICKER	2.02	1MB/6.0		\$10
INSIDE OUT	II	1MB/6.0.2	*	
INSIGHT EXPERT ACCOUNTS PAYABLE	2.1.1	1MB/6.0	*	

PRODUCT	V.	REQ.	*	S
INSIGHT EXPERT ACCOUNTS RECEIVABLE	2.2	1MB/6.0.2	*	
INSIGHT EXPERT GENERAL LEDGER	2.2	1MB/4.2		\$99
INSPIRATION	3.0	1MB/4.2	12/91	*
INSTANT-EXPERT PLUS	2.0	1MB/5.0		FREE
INTERFACE RAVE	2.0.5	2MB/6.0.4		FREE
INTOUCH	1.1.7	512K/4.2	3/92	FREE
ITHINK	2.0	2MB/6.0.2		\$149
KALEIDAGRAPH	2.1	2MB/6.0.5	9/91	\$20
KIWIENVELOPES	3.1	512K/4.1	*	
LABVIEW	2.2	4MB/6.0.5	10/91	*
LANGUAGE SYSTEMS FORTRAN	3.0	2MB/6.0.4		\$100
LAPLINK MAC III	3.2	512K/2.0		FREE
LAPLINK MAC PLUS III	3.0	512K/2.0	*	
LASERPAINT COLOR II	1.02	1MB/6.0.3		FREE
LETRASTUDIO	2.0	2MB/6.0	*	
LIGHTSPEED COLOR LAYOUT SYSTEM	2.5	1MB/6.0.5	*	
MACANALYST	3.1	2MB/6.0	*	
MACARCHITRION	5.5	2MB/6.0.3	*	
MACBRAIN	3.0	1MB/6.0.5		\$295
MACDRAFT	2.1	1MB/6.0.2	*	
MACDRAW II	1.1	1MB/6.0	*	
MACDRAW PRO	1.0.1	1MB/6.0.5	11/91	\$99
MACENVELOPE	5.1	1MB/4.2		\$29.95
MACENVELOPE PLUS	2.0	512K/3.2		\$50
MACFLOW	3.7	1MB/6.0		\$30
MACFORTAN II	3.1	4MB/6.0.3		\$99
MACGLOBE	1.0	1MB/6.0.4	4/92	*
MACLABELPRO	1.5	1MB/6.0.3		\$19.95



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PRODUCT	V.	REQ.	*	S
MACLINKPLUS/PC	6.0	1MB/6.0.3	3/92	*
MACMONEY	3.5	512K/4.0		\$12
MACPAINT	2.0	512K/3.2		\$25
MACPALETTE II	2.2	1MB/6.0.5		*
MACPHONEBOOK	3.0	1MB/6.0	9/91	*
MACPLOT PROFESSIONAL	4.0	1MB/6.0.5		*
MACPLOT STANDARD	4.0	1MB/6.0.5		*
MACPROJECT II	2.5	1MB/6.0		\$99
MACRECORDER	2.03	512K/3.2		*
MACRENDERMAN	1.1	5MB/6.0.5		\$75
MACROMIND DIRECTOR	3.0	2MB/6.0.5		\$195
MACSCHEDULE	2.5	1MB/6.0		\$30
MACSCHEDULE PLUS	1.0.5	1MB/6.0		FREE
MACSPIN	3.01	512K/4.3	3/92	*
MACTERMINAL	3.0	512K/3.2		\$65
MACTOOLS DELUXE	1.2	1MB/6.0		*
MACTOPS	3.1	1MB/6.0.5		*
MACWRITE II	1.1	1MB/6.0		FREE
MANAGING YOUR MONEY	4.0	1MB/6.0.3		*
MANAPRO GENERAL LEDGER	3.1	1MB/6.0		NA
MAPLE V		2MB/6.0.7	5/92	*
MARCOPOLO	1.1	1MB/6.0		FREE
MARKET ANALYZER PLUS	2.0	2MB/6.0.2		\$99
MARKETMASTER	3.5	1MB/6.0.3		*
MARKUP	2.0	1MB/6.0		\$30
MASTERFINDER	1.1	1MB/6.0.5		*
MASTERJUGGLER	1.57	512K/6.0		\$15
MASTERPLAN	1.03	512K/6.0.5		FREE
MASTER TRACKS PRO	5.0	1MB/4.1		\$45
MATHCAD	2.06	1MB/6.0.2		FREE
MATHEMATICA	2.0	1MB/6.0		*

PRODUCT	V.	REQ.	*	S
MATHTYPE	2.1.1	512K/6.0.2		*
MATHWRITER	2.0	2MB/6.0.5		*
MATLAB	4.0	1MB/3.0		*
MEDIATRACKS	1.01	1MB/6.0.2		FREE
MENUFONTS	4.01	1MB/6.0.5	5/92	\$20
METAPICT	2.0	512K/4.5		\$69
META PRO	2.03	1MB/6.0		*
MICHAEL'S DRAW	1.0	1MB/6.0.5	12/91	NA
MICROPHONE II	4.0	2MB/6.0	7/92	*
MICRO PLANNER MANAGER	1.0	2MB/6.0		*
MICROSOFT EXCEL	3.A	1MB/6.0.2	9/91	*
MICROSOFT FILE	2.0	512K/3.2		*
MICROSOFT MAIL	3.0	1MB/6.0.2	8/91	*
THE MICROSOFT OFFICE	1.5	1MB/6.0.2		\$129
MICROSOFT POWERPOINT	2.01	1MB/6.0		FREE
MICROSOFT PROJECT	1.1	1MB/6.0.4	11/91	NA
MICROSOFT WORD	5.0	512K/3.2	4/92	\$129
MICROSOFT WORKS	2.0e	512K/6.0		*
MINDLINK	2.0	1MB/6.0		*
MINDWRITE	2.1	512K/4.2		*
MINICAD+	3.1	1MB/6.0		*
MOCKPACKAGE PLUS UTILITIES	4.4	512K/3.2		\$15
MODELSHOP II	1.1	1MB/6.0.2	3/92	FREE
MORE	3.1	1MB/4.1		*
MR. FILE	1.1.1	1MB/4.2		FREE
MULTI-AD CREATOR	3.0	2MB/6.0.3		*
MULTILEDGER	1.1	512K/3.2		\$75
MUSICPROSE	2.1	1MB/6.0		FREE
MUSIC PUBLISHER	2.5.2	1MB/6.0	12/91	\$15
MYADVANCEDMAILLIST	3.0	512K/4.1		*
MYDISKLABELER III	3.0.4	1MB/6.0		*

PRODUCT	V.	REQ.	*	S
M.Y.O.B.	2.0	1MB/6.0	10/91	*
MYTIMEMANAGER	4.0	1MB/6.0.3		*
NETMINDER ETHERNET	2.1	2MB/6.0		\$100
NETWORK BUNDLE FOR THE MAC	3.0	512K/3.2		*
NETWORK SUPERVISOR	2.0	2.5MB/6.0.3		*
NISUS	3.06	1MB/6.0.2		*
THE NORTON UTILITIES FOR THE MACINTOSH	1.1	1MB/4.2		\$19
NOW UTILITIES	3.0.1	1MB/6.0.4	2/92	\$49
NUBASE FOR THE MAC	1.3	1MB/4.1	1/92	\$75
OMNIPAGE	3.0	4MB/6.0		\$25
OMNIPAGE PROFESSIONAL	1.0	5MB/7.0		*
OMNIS SEVEN		2MB/6.0		*
ONCUE II	2.0	512K/6.0.2		\$34.95
ON LOCATION	2.0	1MB/6.0.5	6/92	\$25
ON SCHEDULE	2.0	1MB/3.0		*
PANORAMA	2.03	1MB/6.0	5/92	*
PAYROLL	4.0	2MB/6.0.5		\$89
PERFORMER	3.61	2MB/6.0.2		*
PERSONAL PRESS	1.01	1MB/6.0.2		FREE
PHONENET LIAISON	3.0	1MB/4.2		\$75
PHOTOMAC	1.5	2MB/6.0.3		\$75
PICKTURE	1.0	512K/6.0		NA
PICTUREBOOK+	1.0	1MB/6.0	2/92	*
PICTUREPRESS	2.0	2MB/6.0.4		*
PIXELPAINT	2.1	2MB/4.1		*
PIXELPAINT PROFESSIONAL	2.01	4MB/6.0.5	9/91	\$125
PLAINS & SIMPLE	1.06	1MB/3.2		*
PLANISOFT	1.3	512K/4.2		\$48

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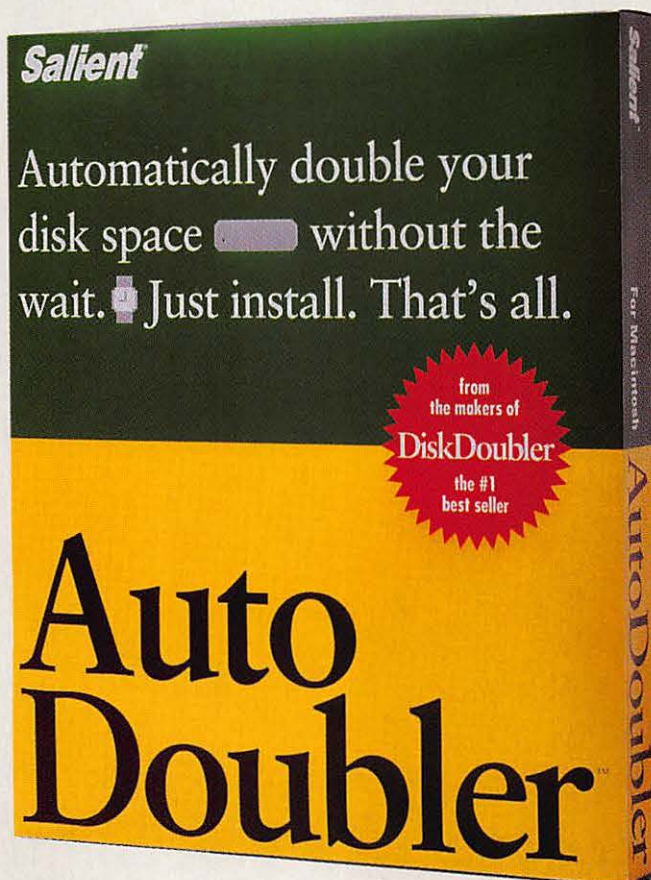
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Circle 39 on reader service card





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"One of the best
products of the year."

—*Fortune*

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—*InfoWorld*

"One of the best new
products of the year."

—*Business Week*

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It's a whole new standard of mobile computing.

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System 7 is standard equipment. So is a rechargeable battery that runs for up to three hours.

It even includes a remarkable new program called AppleTalk® Remote Access. This allows a modem-equipped PowerBook to tap the power of your desktop Macintosh — and any office network that supports AppleTalk — from just about anywhere there is a telephone.

You can retrieve files from the Macintosh in your den without leaving your hotel room. Or print an order form on a printer in your office without leaving your client's office. Or send e-mail from wherever you happen to be to anyone on your network.

With an internal data/fax modem, you can even send your work directly to fax machines.

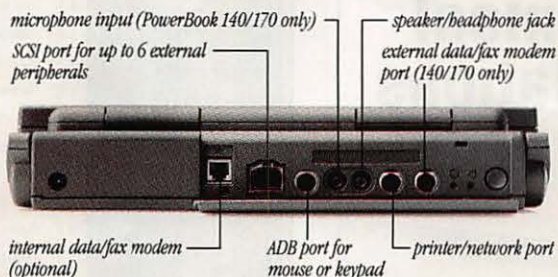
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The power to be your best.





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The PowerBook 140. The performance of a Macintosh IIfx engineered to fit into a mere 6.8-pound package.



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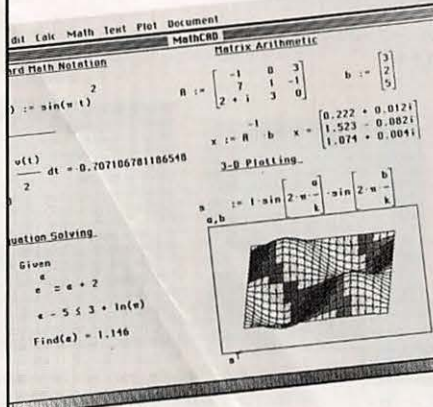


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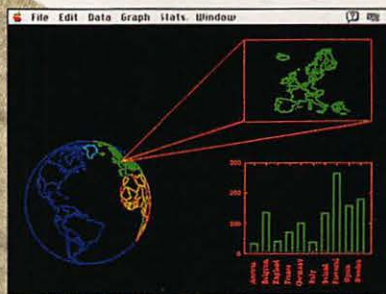
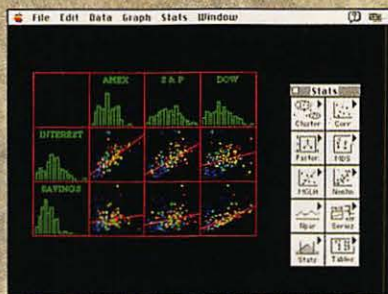
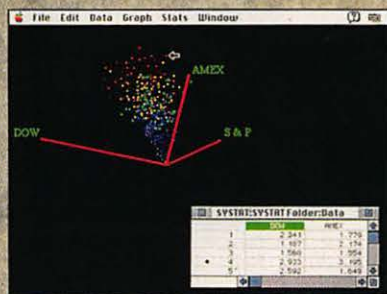
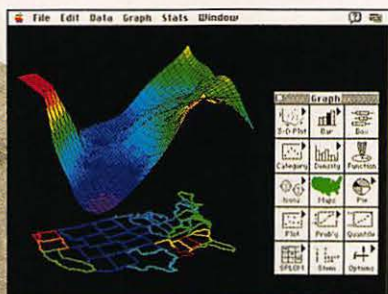
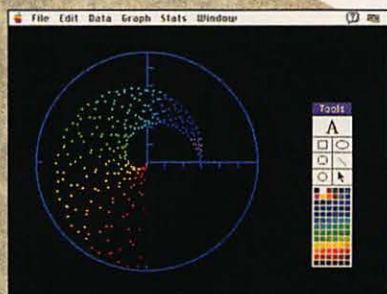
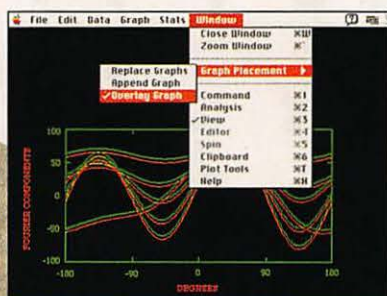
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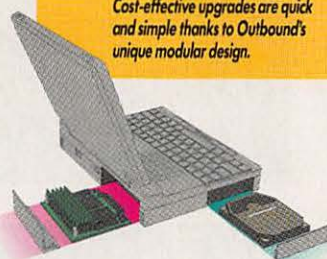
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Lab Notes

What to Expect from OCR

BY TIM WARNER

FEW PEOPLE ENJOY TYPING; THAT'S why OCR is so exciting. Optical character recognition is faster than retyping, and it removes the labor of data entry involved in archiving or building databases. Theoretically, that is. As our tests of 11 OCR packages for this month's OCR roundup, "From Page to Pixel," show, reality is something else again.

The fact is, a document that's been input with an OCR application is frequently riddled with errors, and the quality of the original document or the scan may be to blame. But you want to avoid not only retyping, but also rescanning. While different OCR applications are better at recognizing different types of documents, some problems are common to all.

Avoiding OCR Pitfalls

WE DISCOVERED a few techniques for getting a good scan the first time, and a few pitfalls that you should avoid. First, don't expect the resulting document to look just like the original you scanned. A few OCR vendors claim their applications are able to preserve formatting, such as indents, fonts, type size, boldface, italics, underlining, and even occasionally superscripts and subscripts. Don't believe them—assume that you will have to reformat a good portion of what you scan.

We used Apple's OneScanner in combination with each OCR application running on a Mac IIci (except Xerox Imaging Systems' AccuText, which did not support the OneScanner at the time we tested the programs). Using each application with tens of pages of text showed that format recognition is inconsistent at best. Here are some of the many problems we observed: boldfaced words that mysteriously appeared in the middle of plain text; bold

italic text recognized as plain text; 5-point type in all capitals where 12-point bold small caps should have been; text in which some of the lines ended with hard carriage returns and others didn't; 10-point text that was recognized in various sizes from 6-point to 12-point; underlines where none should have been; extra spaces between words or letters.

The worst offenders were Calera's WordScan and WordScan Plus, but Caere's OmniPage Professional had problems as well. Granted, recognizing formatting is difficult, and not all packages claim this capability. Logitech's CatchWord Pro, OCR Systems' ReadRight for Macintosh, Olduvai's Read-It Pro, and Prism Enterprise's TextScan support text-only format, which can handle only limited formatting, such as line returns and tabs. Ultimately, what determines an OCR program's usefulness is how much modification

is necessary—how often you have to adjust text or formatting to make a document sufficiently like the original.

Some OCR applications treat tables differently than regular text. A *Macworld* free-lancer who needed to compile data for an unrelated article wanted to use OCR to scan 40 formatted pages of research, in hopes of easily sorting the contents. Each page had one column of names and locations followed by three columns of numerical data delimited by pipe characters (|). OmniPage Professional did a fine job of recognizing most of the text, but had problems correctly placing the tabs for the numbers. The free-lancer could not easily use a word processor to fix the formatting and had to retype the data portion; scanning saved a

continues



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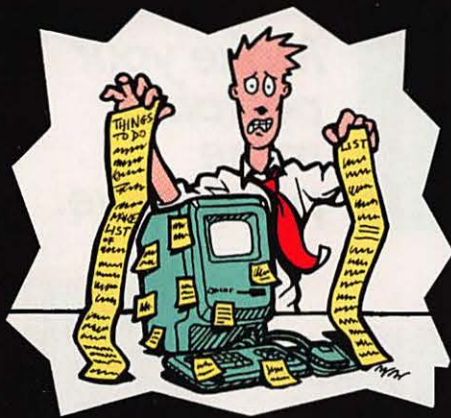
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LAB NOTES

considerable amount of labor, but not all.

Columns present a particularly difficult problem. We found that only a few OCR packages could recognize columns correctly, so we were forced to scan multiple-column text using each program's manual blocking feature (which allows you to select the portions of a page to be scanned). Because most applications read text line by line across the page and put in the number of tabs necessary to set off the new columns, the number of tabs separating the columns may vary from line to line or column to column. This inconsistency requires reformatting of tabular material. However, a word processor that's adept at handling formatting (for instance, Word lets you cut and paste discontinuous blocks of text with an option-key sequence) or a program with macro capabilities can make reformatting easier. Which type of word processor is best for tables depends largely on the recognition method your OCR package uses.

Another problem for OCR is highly stylized text with tightly or loosely kerned characters. Tight spacing causes substitution errors (for example, *ni* or *iii* or *rn* might be recognized as *m*) and can produce large blocks of unrecognized text. Loosely kerned text often results in extra spaces between letters; because OCR programs recognize only individual characters, they're unable to judge which letters should be linked together to create words.

One difficult challenge is recognizing text on a dark or color background. Two of the documents we scanned were newspaper with gray-brown backgrounds. Along with the greater complexity of the newspaper document, the low contrast between the characters and the background lowered the recognition speeds by as much as 69 percent and the accuracy by nearly 30 percent.

Before scanning documents that have color backgrounds or are on newsprint, try photocopying them on a copier using a lighter setting to remove the gray or whiten the background. Then you can scan the copy with a slightly higher darkness setting to make the text darker and more continuous. Don't be extreme about this; a scanner works the same way that a copier does, and errors are introduced not only with every step away from the original but especially whenever you substantially darken the image—eventually the text smears and becomes unrecognizable.

A photocopy of a low-resolution dot matrix printout can be read more easily by an OCR program than the original, because smearing fills the spaces between the dots.

High-gloss originals are also difficult for most packages to read. We had a

glossy thermal paper fax in our original test suite, but had to drop it because the fax faded considerably in just a few days. However, early scans were poor; all the OCR packages had extreme difficulty, some taking as much as 30 times as long to recognize a fax as they did to read the same text on a laser printout—and with much poorer accuracy.

Adjusting Your Expectations

WHEN WE BEGAN THE OCR TESTING, we assumed that each program would be configured to its ideal settings. However, as testing progressed, we learned not to trust the defaults.

To their credit, nearly all the programs in this review save (or prompt you to save) defaults to a file so that your modifications will be immediately available the next time you scan. Dest Recognize, Read-It Pro 3.0, and all the Caere and Calera packages display the scanner settings before every scan, enabling you to set the brightness appropriately.

With one document, we found that WordScan's brightness setting was inadequate because it perceived part of the page as darker than the rest, as if a shadow had been cast over one side of the page. The version we tested (an early copy of 1.0.0) limits the OneScanner to changing brightness settings in 6 percent increments, so all the settings were either too dark or too light. Calera has since modified version 1.0.0 to allow finer control (1 percent increments).

Hewlett-Packard's AccuPage technology, supported by Caere's OmniPage Professional and by Calera's soon-to-be-released WordScan version 1.1, overcomes this obstacle by varying the scanning intensity in different zones to optimize contrast over the entire page. Packages using AccuPage can read documents with variable backgrounds—those with different shades or colors—or documents that, according to Caere, have been stained or weathered by age.

If you don't have an HP or Microtek scanner, try using Light Source's Ofoto gray-scale scanning software to scan originals. Ofoto can straighten a scan as well as optimize its contrast. Saved scans can be queued for unmonitored recognition by OCR programs like Xerox's AccuText.

For best results, use OCR for large sets of homogeneous documents; use the best originals possible; stick to documents with light, neutral backgrounds and dark text; and avoid highly stylized or heavily formatted originals. Someday, OCR technology will be sophisticated enough to handle such tough challenges, but until then, be realistic, and be prepared for some OCR cleanup. **m**

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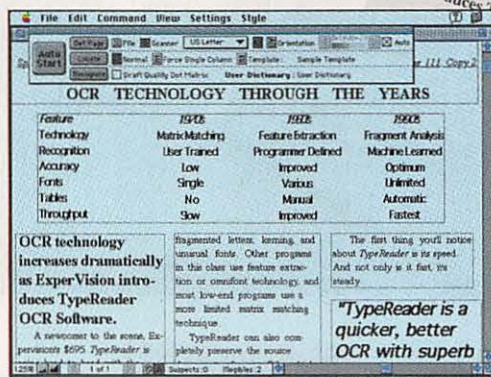
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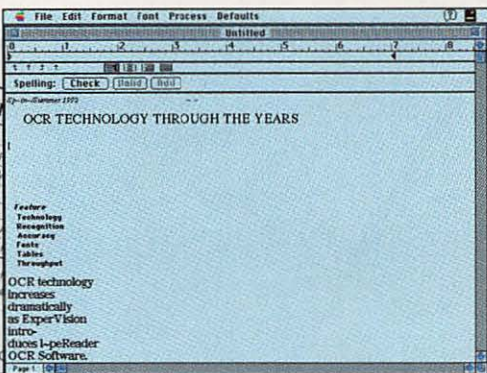
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An Interview with Jim Rea

BY JERRY BORRELL

JIM REA HAS BEEN WORKING with microcomputers for 15 years. A native Californian, he founded ProVue Development, a Huntington Beach-based company that sells Panorama, one of the most enduring and best-selling databases for the Macintosh. He became interested in microcomputers after reading an article about the Altair computer kit in 1975. But after receiving plans for the Altair, Rea decided it wasn't any good—and built his own computer from scratch.

MW When did you see your first Mac?

Rea At SoftCon in 1984. That conference was held a week after the Mac came out, in New Orleans. I was actually excited. I had just seen the ads. And I was working on [Motorola's] 68000 microprocessor earlier. I pretty much bought into the Mac thing. By then I had been working on computers for seven years. I used to tell people who asked me, don't buy a personal computer, because before the Mac I thought computers were too hard for most people I knew.

MW Why were you working with the 68000 microprocessor?

Rea I went to work for Alpha Micro Systems in Irvine; they had a multiuser operating system—an S-100[-based] machine, which they switched to a 68000 CPU. I worked on the OS for two years.

MW How did you get your first Mac?

Rea I bought it from a dealer in New Jersey. I had a friend who knew a dealer who had two Macs on allocation. I was not part of the developer program. I was not someone Apple approached to develop for the Mac. [My friend] told me that if I had the money I could have a Mac, so I did it. And I ordered *Inside the Macintosh*, then a collection of loose-leaf stuff from Apple. I read the book and applied to be a developer. I lived with it for two months. I must have read most of it three times.

MW What about Alpha Micro?

Rea I was still doing that. By May 1984 I was ready to start programming [on the Mac], but I was still not a registered

developer. Apple said I would have to wait one more month to be registered, and then another six weeks for a Lisa to do the programming. I wasn't about to wait three months, so I went to a dealer and bought a Lisa. The catch was you had to have Apple's software for the Lisa, and that only came from Apple. Fortunately, I knew someone who gave me an essentially pirated version of the software.

MW So finally you were on your way to being a Mac developer?

Rea In May I got started. My plan was to write the [database] program on an Alpha Micro and transfer it to the Mac.

I got the Lisa and spent two weeks writing a program to transfer data on the Mac's serial port. [After moving the program to the Mac] I connected the serial port on the Mac to the serial port of the Alpha Micro. I could then take machine code, binary code, from the Alpha Micro to the floppy drive of the Mac. I could try to run that machine code on the Mac and see if it would work.

MW How long before you had a product?

Rea After one month I had a product that could sort, write; it had a little data in it. I could demo it. I had a friend at Alpha Micro who had a C compiler. He ported it to the Mac like I did.

He showed it to the Apple developer group, and they invited him to the Apple booth at the National Computer Conference. He told me about the evangelists and he gave me someone's number.

I called and said I have this program. They said send us the program. I said no way, but I'll fly up and show it to you myself. So I flew up to Cupertino. The first person I saw was Alain [Rossmann]. It was a fun day. Alain got really excited. He was jumping up and down. They asked where I came from and how did I write this program. At that time they knew most of what was happening on the Mac.

MW When was the program finished?

Rea It shipped in September. It was called OverVue. Eventually it sold about 30,000 copies.

MW You are one of the only remaining Macintosh-only developers.

Rea I think so, yes. It's possible. Better to do a few things well rather than a lot of things halfway. ProVue Development is small enough so that if we did Windows, the Mac product would suffer.

MW What has happened in the Mac database market?

Rea Developers come and go a lot. There are only three large products—FileMaker, 4th Dimension, and us.

MW What about the others?

Rea Pfs:File for the Mac was the first. It was a piece of junk ported from the PC. Pfs:File had no features. It died in 1985. Then there was Microsoft File. Then Odesta's Helix. Microsoft File came out in

1985 and was popular for a while. It was the Buick of databases. Standard data, no graphics, utilitarian. Across the board. At one time [Microsoft] had an idea of the grand database, the be-all and end-all, and it never got finished. Helix is still sold.

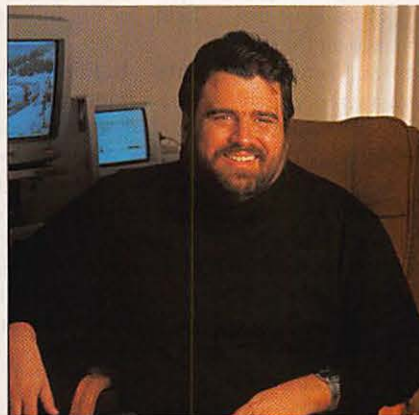
MW What database came next?

Rea There was FileMaker in '85. The original version didn't do too much, but FileMaker Plus took off. It had graphics tools. At that time we were selling OverVue, which did not support graphics.

MW dBase didn't make it on the Mac.

Rea That goes to prove that just pouring money down a hole doesn't make a successful product. Ashton-Tate bought dBase Mac and didn't port their PC product. [That was] the right strategy. Mac owners wanted their own software, not some PC stuff.

continues



PHOTOGRAPHS BY JENNIFER CHEUNG

MW HyperCard was thought of as a database when it was introduced.

Rea Right. I forget that one as a database—that has come and gone. Apple oversold it. [But] the HyperCard phenomenon emerges again and again—everyone will be a programmer. Every few years there is a new product like that.

People's reach exceeds their grasp. They think databases are easy to use. A parallel—word processor buyers don't think that they can write a spell checker. People buy Photoshop, and they don't think that it will make them paint like Rembrandt. But if they buy a database, they want to do complicated things or think that we should teach them to.

MW What divides you from Bill Gates? Why aren't you worth several billion?

Rea Bill Gates. There's only one. Part of what rankles everyone is what Bill has done with his luck. I'm not a Microsoft fan, though. I don't like the Microsoft idea. I do like Bill Gates a lot because I think that he is really the only person in this industry with vision, technology knowledge. Plus he sees beyond that, to the other side—marketing. Most people in the industry are in marketing, like Sculley. Knowledge Navigator just isn't a realistic dream. [But] when Gates talks, he knows what can happen.

Microsoft [goes from] success to success because at the top is a technical person. Most software companies have one success and that's it. Years ago all the rage was one-product companies. [You] don't hear so much about them anymore. Ashton-Tate. WordStar. Turned themselves into [multiproduct] companies.

MW Let's talk about Panorama.

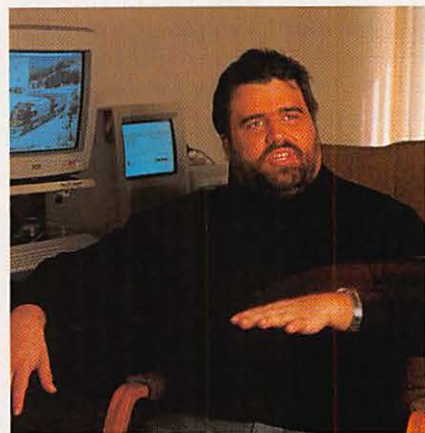
Rea Panorama is different from other databases. It's RAM based. It loads all of your data into RAM when you operate.

MW That sounds tough in a System 7 world. Doesn't it use most of the system's memory?

Rea We hear that objection less and less. Now it's easy to get 8MB on a CPU. FileMaker and 4D pull data from disk. To find data they use an index, not the whole disk file. There is a problem with indexing: it consumes disk space. One megabyte of data may have 4MB to 5MB of indexes, four to ten times more disk space for the index than for the database. So when you compare file sizes of 5MB for a FileMaker file, you're only talking about 1MB in a Panorama file. People forget that.

The other problem with an index is that it can only look at data in a certain way. As in 4D, where you can only pick

certain fields to be indexed. Pick all you want, but that slows it down. If you don't index in advance, you can't search the data. And in 4D you can't search for a partial match—say, something within a word, or a mathematical relationship—only entire entities. Say you want to find everyone on a certain street. Generally you can't do that with an index system. You can with FileMaker, but it has a different set of limits. What's stored in the database



is the numbers of street addresses, but not the entire street because it's not indexed that way.

MW And you can't add to such indexes?

Rea No. It's a structural thing of setting up the database. Generally not. Certain fields are not indexed at all.

MW In FileMaker?

Rea It indexes every word. On the other hand, there are some problems. No punctuation. A and A+ look the same. You cannot do things [you can] do in Panorama. Like "find all of the checks in a checkbook database that are more than 10 percent of the balance." You could do that in 4D by writing a program, but the program takes a while to run because the program must look at each check, that is, each record.

MW So the truth is that Panorama is not for large users.

Rea You wouldn't automate General Motors' accounts receivables with it. My biggest [list of] records is 90,000. It takes 6MB. Ninety thousand names, addresses, phone numbers. You probably couldn't put 90,000 invoices in 6MB.

MW Does the original dBase on the PC have any role on the Mac?

Rea Yes. But it has no future other than what FoxBase+/Mac manages to carve out. FoxBase+/Mac gives DOS dBase users a way to port their applications to the Mac. Probably few will start new applications. It's not a growth industry. On

the other hand, anytime a language has a billion lines of code written in it, it will not go away.

MW Another distinction that people make about databases is whether they're programmable or end-user oriented. Is that useful?

Rea It can be. Products like dBase or 4th Dimension—generally [end users] can't use those products without programming. Say you want to put an application together that allows you to sort data. Panorama has a feature called cross tabs that allows that. 4D could do the same if someone wanted to write a program, which would take hours or days.

MW Do you see Claris as a competitor?

Rea They sure are.

MW How do you reflect on that?

Rea Life isn't fair. I don't think it's fair. I don't think people know that Claris is wholly owned by Apple. It's interesting that Apple doesn't seem to care about third-party developers. First Claris was to be spun out. Apple would not compete with its developers. [But] that's just what they've done. Recently they have taken the guts out of the developer program. They've lowered [developer] discounts for hardware. They just banned the developer credit card purchase program. Looks to me like they're headed toward disbanding the developer program altogether.

MW Apple has provided a lot of support to the database market. To Ashton-Tate. To ACIUS.

Rea That was a long time ago. 4D was in-house for a while. Jazz was not in-house but it got a lot of support.

I don't think I would want Apple directing industrial policy for the nation. When we did work with them they were always calling at the last minute, wanting \$10,000 [for a project], and we had to decide [whether to participate] overnight, but if we could decide before they hung up, even better.

MW Do you plan to remain an Apple developer?

Rea Yeah. I like the computer. I think that the people who designed the original Mac did a great job. As a programmer, [with] almost every system I've worked on I've always come up against things that people who designed the system didn't anticipate. You end up duplicating part of the operating system to make it do what you want. On the Mac that almost never happens. Apple anticipated that people would want to do things that they themselves didn't anticipate. **m**

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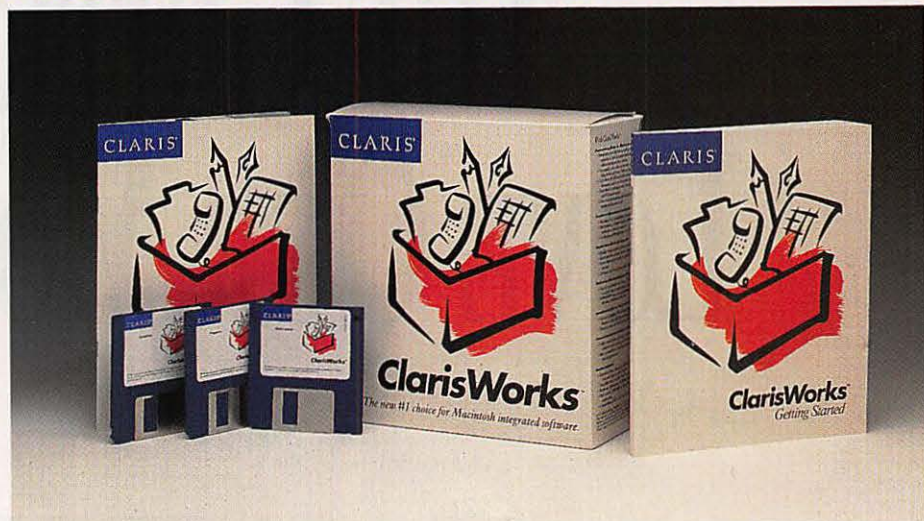
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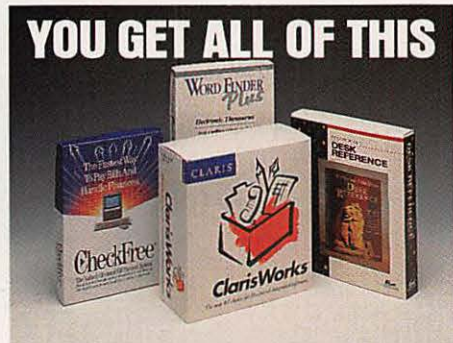
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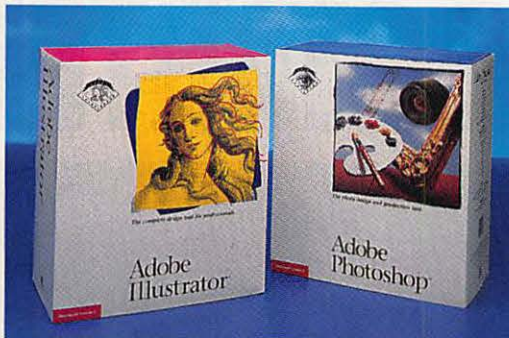
Draw, Paint, Retouch. Make Digital Movies!

REVIEWER'S NOTEBOOK: In addition to the two industry standards reviewed on this page: Adobe Illustrator and Adobe Photoshop, TigerSoftware is proud to be among the first to offer Adobe Premiere, an incredible new title that allows you to combine video footage, audio, animation, still images and graphics to produce digital movies on your Mac. Uses Apple's QuickTime media-integration technology, multi-unit production hardware isn't required. Adobe Premiere is fast and yields high-quality results. Interactive presentations, television ad concepts and roughs, video databases, merchandising sequences and training sessions are just a few of the wide-ranging uses for this new title.

ADOBE ILLUSTRATOR:

A slew of impressive industry awards grace the Illustrator box, a clue to the amazing capabilities you'll discover inside. Indeed, Adobe Illustrator is the most powerful drawing, page design and production tool in the world today, ideal for designers with a desire to elevate their work to a new vista of speed and creativity. It's the only system capable of precise illustrations, extensive text handling, fully automatic graphing and color separations. You can work from existing images if you like — just scan it and you're ready to begin. Or draw from scratch using Illustrator's magnificent set of drawing tools, the envy of the industry. It's as simple as moving the mouse.

Professional pages depend on the ability to handle text in a variety of ways. (This package includes free Adobe Type Manager and 13 type faces). Nothing allows more creative opportunities than Adobe Illustrat-



tor when it comes to integrating text with your designs, illustrations, line art, images and photos. Just enter your text on screen, or quickly import it from your word processor. Then take control of the kerning, tracking, word and letter spacing.

Create tight wraps around shapes (or any path, like circular type) and images, viewing your alterations on your screen as you work. Flow text between columns, add unlimited numbers of characters and styles from any PostScript Type 1 font (including the entire Adobe Type Library). You can even convert the type to outline images, and then create images from them.

Creating charts is a snap with Illustrator. Just type in your data, select a chart type and it's done. Customize your charts with your palette of creativity and revise them in just a few seconds. You'll create top-notch ads, brochures and more, from concept to final production and color separations. In fact, the Adobe Illustrator box was completely created using the product. Color capabilities include smooth 24-bit screen reproduction (8-bit is supported for B&W).

ADOBE PHOTOSHOP:

The ultimate color-retouching/image processing system for the Mac. A great pre-press and production

tool, Adobe Photoshop has garnered loyal users in all areas of graphic design and color reproduction. Using its extensive features, it's able to create anything you can imagine. Full 32-bit color artwork with full control and flexibility to manipulate and combine photographic images, and the ability to create stunning video effects. Color separations are precise, meeting or exceeding even the strictest standards for reproduction. You can produce bitmapped, gray-scale or continuous-tone color, add color, change it or remove it completely. Produce intriguing duotones, tritones and quadtones. And you can use your existing Adobe Illustrator files in your Photoshop images. You've got a great selection of creative tools right at your fingertips. Call for details for Adobe latest hit...

ALL NEW! ADOBE PREMIERE...

Become a movie maker — with the help of your Mac — and new Adobe Premiere. It's the newest creative tool from the leaders in precision graphics and photo manipulation.

FREE! BUY ANY ADOBE PRODUCT GET A FONTBANK SAMPLER DISK.

ADOBE

BBT2501 Adobe Photoshop	\$559.95
BBT2502 Adobe Illustrator	\$379.95
BBT2503 Adobe Premiere	\$315.95

Adobe Illustrator: Macintosh II, LC or SE product line, Plus or Classic with a hard disk; at least 2 MB of RAM using System 6.0.5 or greater or 4 MB of RAM using System 7. **Adobe Photoshop:** Macintosh II product line or SE product line with at least 2 MB of RAM; System 6.0.4 or later and a hard disk. **Adobe Premiere:** Macintosh II family computer; 4 MB RAM; high-capacity hard drive (80 MB or more recommended); System 6.0.7 or greater; QuickTime v1.0 or greater; 32-bit QuickDraw v1.2 or greater.

Fully-Editable, Full-Page Photo-Images for Print, Multimedia

REVIEWER'S NOTEBOOK: It was love at first sight — on a professional level, of course. These professional photographs, scanned into Mac images with breakthrough scanning technology, are simply the highest quality work we've ever seen. We thumbed through the sample guide and were instantly awe-struck with the immense character and depth of artistic creativity. Each and every image is a fascinating work of art designed for professional applications. We loaded one into PhotoShop and were stunned with what the filters and special effects could do with such a high-quality image. It was spectacular. In ShowPlace, we wrapped a burl elm background around an office desk and stood back gazing. We couldn't tell if it was the real thing or not!

Picture this: a library of 100 photographic images for your Mac. FOLIO 1 features full-page photographic backgrounds and textures for print, multimedia, and presentation graphics.

With FOLIO 1, you can add a splash of color to a page... fill a logo with a texture... create a patterned illustration... build unique templates for slide presentations... make backdrops for product shots... touch up attractive advertisements and brochures with graphic elements... add decorative trim to multimedia menus... produce broadcast-quality chroma keys... and even map textures to 3-D renderings!

Why Settle For Clip-Art? Why Pay For Stock?

There's no need to settle for the amateur look of clip-art or the high costs of one-time-use stock photography. With FOLIO 1, you get professional photography without royalties or restrictive use rights. Every image includes a lifetime of unlimited use.

FOLIO 1 is the perfect companion for your page-layout or multimedia software. If you can open, place or copy a TIFF or PICT image, you can use FOLIO 1!

Unmatched In Quality. At D'pix we understand the #1 rule of scanning: garbage in, garbage out. That's why we've emphasized quality every step of the way, using the finest studio equipment, film, and transparency scanners. From thousands of shots, only the best make it to the scanning stage. Images are scanned at up to 5,000 dpi, to capture the finest details, at 48 bits, for the most accurate colors on the market. Images are resampled to 24-bit and two resolutions: one for magazine-quality print, the other for multimedia and business-quality print.

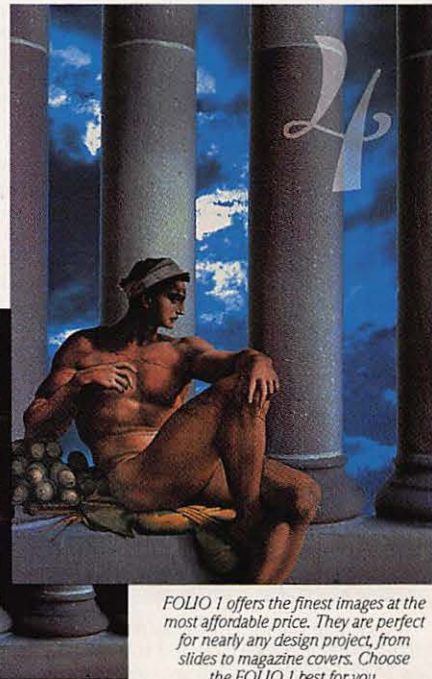
The FOLIO 1 Image Library is available in two different packages: FOLIO 1 Print Pro and FOLIO 1 Media Kit.

FOLIO 1 Print Pro. Available only on CD-ROM, the FOLIO 1 Print Pro is for the serious color professional who requires full-page images for magazine-quality reproduction.

FOLIO 1 Print Pro includes 100 images from 10 categories: Abstract, Fabric, Food, Marble, Masonry, Metal, Nature, Novelties, Paper, and Wood.

These images are perfect for multimedia, presentation graphics, and business-quality print. Each image is 900x675 pixels, 24-bit color, 9"x12", and 2 megabytes. The quality is unmatched!

In addition, the package includes your choice of one free category of 10 magazine-quality images un-



FOLIO 1 offers the finest images at the most affordable price. They are perfect for nearly any design project, from slides to magazine covers. Choose the FOLIO 1 best for you.

locked from the CD-ROM. The remaining 90 images can be purchased as either unlocks or 4"x5" transparencies for only \$75 each.

FOLIO

BBT2777 Folio 1 Print Pro	\$325.95
BBT2778 Folio 1 Print Pro CD-ROM	\$325.95
BBT2779 Folio 1 Media Kit	\$245.95
BBT2780 Folio 1 Media Kit CD-ROM	\$245.95

CD-ROM STARTER PACKS



WORLD CLASS
NEC READERS

NOT ONE
MORE THING
TO BUY...

HERE'S EVERYTHING YOU GET: YOUR CHOICE OF READER AND ALL OF THIS...

	Retail Value
CDR 36 Reader or CDR 73 Reader	\$799.00 \$999.00
Complete Interface Kit	99.00
Koss Speakers	59.00
Stereo Headphones	29.00
Desert Storm	99.95
Toolworks Illustrated Encyclopedia	395.00
World Atlas	79.95
Family Doctor	149.95
Sherlock Holmes	99.00
Shakespeare	99.00
Birds Of America	99.00
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Cinderella	79.00
Ludwig Van Beethoven Symphony No. 9	89.00
The Time Table Of History: Science & Innovation	99.95
U.S. History	395.00
Total Value with CDR 36 \$2949.70	Your Price \$599
Total Value with CDR 73 \$3149.70	Your Price \$799

READ THIS BEFORE YOU BUY A CD-ROM READER ANYWHERE ELSE!

PUBLISHER'S NOTE: I've noticed lately that the CD-ROM market is not only getting big — but also very tricky as well. In fact, I'm annoyed at my competitors who market no-name drives at ridiculous prices like \$199... Those drives have incredibly low response times, and do not include the latest in laser technology. Will the interface be 100% compatible with your computer? They must get a lot of returns on those things. The offers are tricky, too. First I buy a reader, then I pick two CDs from page 4, row 8, then I pick from Page 11, third column — each pick costs me more money... by the time you're done, you've spent \$1000 for an off-brand! That's why we offer the NEC line of quality crafted CD ROM readers — and made the offer very simple. Everything's included. One price. Complete interface kit, a pair of Koss premium sound stereo speakers, stereo headphones and 14 TOP-SELLING CD TITLES! After all, what good is a reader without some tasty software to use with it? The NEC CDR 36 and CDR 73 are the best in the business, packed with advanced technology and a 100% guarantee from Tiger and NEC — names you know. In fact, our "No Down Time Guarantee" protects your reader forever.

You simply pick either the ultralight, ultrafast portable CDR 36 or the firebreathing CDR 73, the industry's premier speedster. Prices start at \$599 and that's a massive value for that price. Compare! Really, take a look at the offers and you'll see that TigerSoftware is the most intelligent way to get into CD-ROM. Now who's CD-ROM offer looks better?

Everything you need to get started is inside — including 14 of the hottest CD-ROM software titles. Your Koss SA/30 amplified stereo speakers pump out the sound as you explore full-interactive computing.

Hundreds of thousands of diskettes' worth of information, fun and productivity are packed onto just 14 speedy CD-ROMs! They include an amazing, full-length encyclopedia, complete with enhanced sound. There's a comprehensive world atlas — presented in full-color, a *Time Table of History* — covering man's scientific accomplishments from the beginning of time, and *Family Doctor*. Without a doubt, it's the perfect introduction to CD-ROM, with everything included!

THE SOFTWARE LIBRARY INCLUDES: The Toolworks Illustrated Encyclopedia. Critically acclaimed and widely used, The Toolworks Illustrated Encyclopedia features the entire text of a 21-volume encyclopedia — stored on a single compact disc!

Desert Storm: The War in the Persian Gulf. The acclaimed CD that lets you experience Operation Desert Storm in full sight and sound. Chronically the war and the events that precipitated it, it provides new reports, eyewitness accounts, and more.

Sherlock Holmes. An absolute for electronic game fans, Sherlock Aficionados and deductive reasoners! You get to interact with the on-screen characters, embarking on three cases with the super-sleuth himself.

Ludwig Van Beethoven Symphony No. 9. A fascinating way to experience Ludwig Van Beethoven's classic Ninth symphony, exploring and understanding the entire work, as well as its historical setting...all while listening to the music itself.

Birds Of America. This disc is perfect for bird watchers, history buffs, fine art students, and libraries.

Cinderella: THE ORIGINAL FAIRY TALE. Just "point and click" and the classic fairy tale comes to life in this interactive program using music and sound to enhance reading development and language skills.

Software Toolworks World Atlas. This title is an almanac, world factbook and atlas — all in one! It's a remarkable package that contains the most extensive

collection of full-color maps you'll find anywhere.

Shakespeare. The world's greatest playwright, proven to be the most enduring English language author of all time, is now available on compact disc.

CIA Fact Book. The CIA has been busy — collecting facts, stats, maps, sound clips and more! They've assembled megabytes of inside information on one CD and made it available to you.

Cosmic Osmo.

Winner of the 1990 MacUser award for "Best Recreational Program," this fascinating adventure game follows Cosmic Osmo to the Worlds Beyond the Mackerel. You'll explore seven unusual new worlds, and meet a host of intriguing new characters.



The Time Table of History: Science and Innovation.

Or, slip in the Time Table of History: Science and Innovation. More than 6,000 entries show the chronology of historical, scientific and technological events from the beginning of time to the present.



U.S. History. U.S. History on CD-ROM provides detailed coverage from a variety of historical perspectives on political, aerospace, geographic, social, military and economic history.

TIGER CD BUNDLES

BBT8373A CD Bundle w/CDR-36	\$599.00
BBT8336A CD Bundle w/CDR-73	\$799.00

Requires Macintosh Plus, SE, SE/30, Classic, LC or II series running system 6.05 or later with a minimum 2MB RAM and a hard drive with at least 10MB available space. Hypercard version 2.0 required for Time Table and Ludwig Van Beethoven's Symphony No. 9.

Sorry, free shipping is not included with these items. No returns.

MULTIMEDIA

**WHY SETTLE FOR SECOND-RATE EQUIPMENT?
THESE ARE STATE-OF-THE-ART MULTIMEDIA SETS. NOTHING ELSE TO BUY!
FULL MOTION VIDEO! DIGITAL SOUND! 11 FREE CD TITLES!**

REVIEWER'S NOTEBOOK: The dizzying impact of sight, sound and motion is not easily forgotten. Our first experience with Multimedia CD-ROM felt like entering a new world — it grabbed our senses! If you make presentations or conduct training, adding sound and motion will yield incredible results: it's fun watching an audience with their mouths hanging open — completely entranced by what they're witnessing! This hot new technology enhances communication, there's nothing quite like FULL MOTION VIDEO. We've included 11 smash CD software hits to get you going — that's thousands of diskettes worth of information. These discs are packed with mesmerizing sound, magnificent animation and video, language lessons with spoken pronunciations, gripping games, color-drenched maps and plenty of information — with the added dimension of stereo sound. The world of Multimedia CD-ROM is here.

Tiger has two complete multimedia packages to choose from. The first, features the CDR-37M, the ultralight, portable reader with zippy response times and rugged NEC quality. You also get the complete interface kit, including all the cables you'll need, a pair of high quality Persona Micro speakers (that pump out bonecrushing sound), and a CD-ROM caddy that holds 30 titles. The CDR-74M is the fastest reader in the world! Breathtaking 280 millisecond response speed and a brand new design incorporating state-of-the-art optical technology. Of course you get all the goodies: Full NEC interface kit, Persona Deluxe speakers, all the cables, 11 CD ROM current-release titles, and the sleek CD caddy!



The Value-packed CDR 37M package includes everything you see here. Includes high-quality Persona Micro Speakers for crisp, digital audio!

HERE'S EVERYTHING YOU GET

CDR-37 TIGER BUNDLE	Retail Value	CDR-74 TIGER BUNDLE	Retail Value
CDR-37M CD-ROM Reader	\$449.00	CDR-74M CD-ROM Reader	\$675.00
Complete Interface Kit	99.00	Complete Interface Kit	99.00
Persona Micro Speakers	80.00	Persona Deluxe Speakers	229.00
30 CD-ROM Holder	29.95	30 CD-ROM Holder	29.95
CIA Fact Book	99.95	CIA Fact Book	99.95
Desert Storm	99.95	Desert Storm	99.95
Orient	99.95	Orient	99.95
Toolworks Illustrated Encyclopedia	395.00	Toolworks Illustrated Encyclopedia	395.00
World Atlas	79.95	World Atlas	79.95
Sherlock Holmes	99.00	Sherlock Holmes	99.00
Shakespeare	99.00	Shakespeare	99.00
Birds Of America	99.00	Birds Of America	99.00
Family Doctor	149.95	Family Doctor	149.95
TimeTable: Science & Innovation	99.95	TimeTable: Science & Innovation	99.95
U.S. History	395.00	U.S. History	395.00
Total Value	\$2374.65	Total Value	\$2749.65

**AN INCREDIBLE VALUE
ALL THIS—JUST \$699**

**AN INCREDIBLE VALUE
ALL THIS—JUST \$999**

THE CDR-37 TIGER BUNDLE



The CDR 74M package is a monster — over \$2700 in multimedia equipment — yours for just \$999!

Get everything you see! A complete multimedia video/audio setup — nothing else to buy! Plus 11 smash hit CD titles!

THE CDR-74 TIGER BUNDLE

TIGERSOFTWARE IS THE CD SOURCE

TIGER MULTIMEDIA

BBT8437 CDR-37 Multimedia-ready Bundle	\$699.00
BBT8474 CDR-74 Multimedia-ready Bundle	\$999.00

MULTIMEDIA ACCESSORIES

BBT8855 Persona Deluxe Speakers	\$170.00
BBT8857 Persona Micro Speakers	\$79.00
BBT8925 CD Flipper	\$24.95

Sorry, no free shipping on these items. No returns.

TIGER MULTIMEDIA ACCESSORIES! All The Extras For Sound And Motion CD-ROM. The Persona speakers, available in two sizes, are designed to compliment the look of your Mac. The Persona Micros are compact dynamos, churning out rich, vivid sound. The Persona Micros match your Mac perfectly, and take up a touch of space on your desktop. They're small enough (and powerful enough) to put on a shelf — or out of the way completely behind a plant!

We've also got the Persona Deluxe Speakers — for premium sound! These unique speakers can be mounted on your PC, for "stereo desktop" games, presentations, sound effects and interactive titles.

CD FLIPPER. Your CD software titles (along with your audio discs) stay neat and organized on your desktop with an ultra-modern designed CD Flipper. The rugged, single-piece aluminum construction and clean, low-profile design allows compact storage, and instant "flip-view" display.

The Black, oven-baked finish stands up to heavy use.

The Wall Comes Down! DOS And Mac Unite!

REVIEWER'S NOTEBOOK: At last! The great barrier between Mac and DOS compatibility has been removed — for good. As a user of both Mac and DOS computers, I know the pros and cons. Macs are friendly and advanced, but the DOS world has more people creating more software. Specialized software that might fill your particular needs. Plus today's office environment uses a mix of DOS and Mac computers, which plays havoc with spreadsheet and data files needing to flow smoothly between Mac and DOS PCs. That's why we at Tiger are proud to offer the world's best-selling answer from Insignia Solutions, a dedicated company who has had a five-year mission: To bridge the compatibility problem between different worlds of software.

AccessPC. Slip a DOS floppy into your Mac and it looks just like a Mac floppy! An icon appears, you double-click it and DOS files and sub-directories appear just like the were Mac files and folders. Double-click on the DOS files and immediately run Mac applications like Word, 1-2-3 Mac and Excel. AccessPC is still the fastest — fully 4 to 10 times faster than the competition! **Now with Cartridge and Magneto-Optical Drive Support!** AccessPC is instantly compatible with your external cartridge and magneto-optical drives. No other utility software is needed! (Unlike the others that make you call your drive manufacturer for software they haven't even finished yet.) Your DOS files are ready, willing and able with the finest DOS file access application made — AccessPC.

Added bonus! Intelligent disk cache for your cartridge and magneto-optical drives can increase performance by 30% or more — and it's free!

SoftPC Family. Turn any Mac into an advanced DOS computer! Run virtually any DOS application from within a Mac window, complete with all the extras.

SoftPC will turn any Mac into a 286 AT computer, complete with a full 640 K of memory and DOS 3.3.

Run a DOS program and print directly to any Mac printer — just like it was an industry-standard Epson LQ2500 (which virtually all DOS programs support). Or if the DOS program supports Postscript printers, you can print directly to any LaserWriter or other Mac PostScript printer. TrueType fonts are even included for the Epson LQ2500 so you get crisp, clean printouts every time.

Getting your data between DOS and Mac has never been easier. Cut & Paste with the Mac Clipboard between all DOS and Mac windows.

Put DOS files and applications on any Mac drive — any folder or volume that appears on your desktop can be used, even remote hard disks on networked Macs.

Entry Level SoftPC. This member of the SoftPC family was designed for low-cost Macs including the Mac Plus, SE, LC, Classic and Portable. You get everything mentioned above including IBM AT 286 emulation, DOS 3.3 and CGA graphics.

Universal SoftPC. Step up to Universal SoftPC and you add several new capabilities to the Entry Level SoftPC package. CD-ROM support lets your Mac CD reader play DOS CDs. And if you purchase the optional SoftNode add-on, you can access Novell Network networks. It's the perfect solution for offices with specialized Novell software.

SoftAT. Fasten your seatbelt and hang on as SoftAT takes DOS software to new levels of high-performance. You need a Mac LC, SE30, Mac II si, ci, cx, fx, Quadra or PowerBook 140 or 170 to run it, but it's all speed.



You get lightning-fast benefits like a math coprocessor, EGA graphics for more demanding graphics applications and expanded memory for big, hungry programs.

SoftNode. Another Insignia Solutions breakthrough is SoftNode — the perfect solution for running Novell Network PC client software on any Mac. With the addition of the SoftNode add-on, both Universal SoftPC and SoftAT can run off-the-shelf and customized MS-DOS programs on any Mac.

**Buy SoftAT or SoftPC And Get
Formtool & Personal Law Firm Free**

INSIGNIA

BBT2050 AccessPC	\$65.95
BBT2053 Entry Level SoftPC 2.5	\$139.95
BBT2054A Universal SoftPC 2.5	\$209.95
BBT2054B Universal SoftPC 2.5 10 Pk.	\$1399.95
BBT2055A SoftAT 2.5	\$315.95
BBT2055B SoftAT 2.5 10 Pk.	\$1999.95
BBT2056A SoftNode 1.0	\$115.95
BBT2056B SoftNode 1.0 10 Pk.	\$699.95

Network Management Headaches?

GraceLAN Network Manager. Provides a complete profile of each person's system details and applications in a single screen. Identify users with specific needs (those who may require System 7 or extra RAM, etc.), before they become problems. With the ability to track these details, you can eliminate any down time for your users — in just a few minutes. You'll quickly spot incompatibilities, troubleshoot system conflicts and build a complete software and hardware inventory. You'll verify software license agreements and synchronize all system clocks on the network (critical for timed backups) and keep a complete, detailed log of printer use and activity. Print reports of all GraceLAN Network Manager's findings.

Honored with MacWeek's Target Award for "Best Network Management," GraceLAN Network Manager is a must for smooth network operation.

GraceLAN Update Manager. The new software is here! You want to update every user on your network as soon as possible. A simple — but very time-consuming — process. Installing it on 10, 20 or 30 machines can take hours and hours. A better way? It's called GraceLAN Update Manager.

GraceLAN Asset Manager. This unique program automatically provides a central storage facility for hardware and software inventory details on every device on your network. Asset Manager is actually a powerful relational

database with custom data fields to handle network inventory — including serial numbers, locations, purchase details, depreciation schedules, maintenance logs, history notes and more.



GraceLAN

BBT2374	GraceLAN Network Mgr	50 Node 2.0	\$299.95
BBT2375S	GraceLAN Updt Mgr	Single Mgr	\$199.95
BBT2375M	GraceLAN Updt Mgr	Multi Zones	\$299.95
BBT2376	GraceLAN Asset Mgr		\$599.95
BBT2370A	TechWork Nubus	10 Basic Ethernet Card	\$189.95
BBT2370B	TechWork Nubus	Thin Ethernet Card	\$189.95
BBT2371	TechWork SI	10T/Thin Ether. Kit	\$245.95
BBT2372	TechWork LC	10T/Thin Ether. Kit	\$215.95
BBT2373	HubWorks/8, 8 Port	10 Basic Hub	\$259.95
	Call for more information.		

Double Your Disk Space Without The Wait!

REVIEWER'S NOTEBOOK:

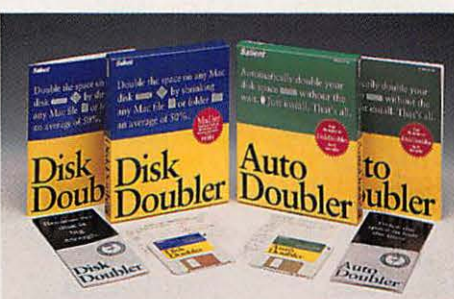
Disk compression is a very hot topic with today's computers. Now you can double (or more) the space on your hard disk without sacrificing speed or safety. Imagine — twice the hard disk space — without losing anything. Totally Automatic. Totally in the background. Totally safe.

It wasn't always this way. Other compression software we tested years ago didn't meet our standards. But today, we can highly recommend compression software from Salient. Their two disk space solutions, DiskDoubler and AutoDoubler, are tops in their class. MacUser rated them at 4-1/2 mice and said, "DiskDoubler rates as the best of its kind."

DiskDoubler. DiskDoubler is a powerful file compression utility that makes disk drivers more efficient. It increases a disk's storage capacity by two or more times!

DiskDoubler is easy to use. It lets you select any file or folder on your disk and compress it in seconds. The immediate result is more free disk space.

Once a file is compressed, you can



use it as you normally would. Just double-click on a compressed file to open it. Any application can open a compressed file, just as if it wasn't compressed. DiskDoubler even remembers which files have been opened and recompresses them automatically when you're done.

AutoDoubler. If you're looking for more disk space, you're looking at the right product. Because AutoDoubler gives your drive twice the capacity — automatically! Its patent-pending technology compresses files and applications to half their original size.

Just double-click to install and AutoDoubler does the rest. It's that fast and that easy. In fact, AutoDoubler lets your Mac use files and applications while they're still compressed!

DISK DOUBLER

BBT2606	DiskDoubler	\$45.95
BBT2605A	AutoDoubler	\$45.95
BBT2605B	AutoDoubler 10 Pack	\$299.95

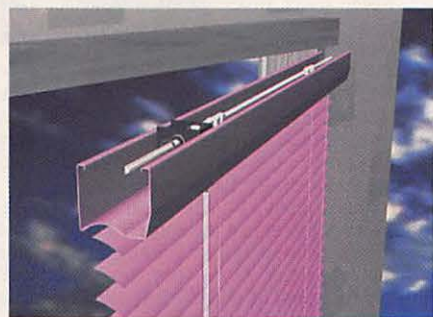
Sweet Sur-Render!

REVIEWER'S NOTEBOOK: This page is devoted entirely to the art of animation, 3-D modeling and photo realistic rendering. It's a new frontier for the Macintosh spearheaded by the incredible Swivel 3D Professional and SwivelMan, which includes MacRenderMan. Swivel 3D Pro and SwivelMan have raked in some heavy industry awards, including MACWORLD's "World Class Award," MacUser's Editor's Choice, and INFOWORLD's "Buyer's Assurance Award" to name a few. We were amazed at how capable these products are, and after speaking to some devoted users — along with having some fun ourselves — we understand why they are the premier design and animation products in the industry today.

Swivel 3D Professional is the most complete modeling and design environment: move and handle objects with power and simplicity. Animate 3-D models by setting keyframes. Swivel will automatically create the frames in between. SwivelMan enables you to create amazing 3-D models and render them by applying photorealistic textures and shaders.

ModelShop II is also reviewed here; enabling architects, interior and landscape designers and civil engineers to quickly create desktop models for presentation and unique visualizations. Converts popular 2-D CAD product (including Claris CAD, AutoCAD, Graphsoft Minicad plus and more) to stunning, lifelike 3-D. Lines become walls, solids extrude. ModelShop II enables you to draw and design freely, with premium flexibility, before (and in lieu of) committing ideas to hand-rendered drawings. You can actually walk-through or fly-by cities, interiors, buildings and landscapes in real time.

We'll also take a close look at MacroMedia's SwivelArt Collections of ready-made 3-D models for use in Swivel 3D and other Multimedia and desktop programs. Choose from North and South American maps, Europe, Asian, Australian and African maps, Cars and Air and Sea models. There's also a collection of anatomical and human forms. You are in control — resize, shade, rotate, scale and color these 3-D clip images any way you like. And just released! — LifeForms, a collection of detailed human motion animations. Now you can add moving human shapes to your models, renderings and animated sequences.



Create detailed interior drawings in full color.

Swivel 3D Professional 2.0. Rendering, sex and rock 'n' roll! Enter another world with Swivel 3D Professional, the 3-D modeler, and SwivelMan, which includes Swivel 3D Professional and MacRenderMan, the award winning 3-D photorealistic rendering sensation.

Macintosh graphic designers, animators and illustrators are producing computer images, video presentations and even print media with stunning results — and loving every minute of it. But perhaps the greatest advantage is the ability to quickly VISUALIZE ideas and designs with the impact of the third dimension. Swivel 3D Professional 2.0 is superbly designed, with an interface that enables you to move with blistering speed. Build amazing 3-D scenes with uncanny realism and almost effortless object handling. In fact, NASA

relies on Swivel 3D Professional for scientific visualization, concept modeling and idea development. Operational methods are conceived using Swivel 3D for robotics and planetary exploration. The ability to quickly create models and put them into action before building pre-prototypes of mechanical devices saves time and money. For print applications, Swivel 3D Professional exports Adobe Illustrator format, so views of models can be edited directly in Illustrator. Joe Lertola of TIME Magazine uses this method to create many of his infographics.

Rendering and output capabilities include fast, incredibly smooth shading, 24-bit color output capabilities, 24-bit image mapping, 8 independent light sources, environmental mapping, specular highlighting, RenderMan RIB output, along with AutoCAD DXF output. Produce PostScript halftones for color separations.

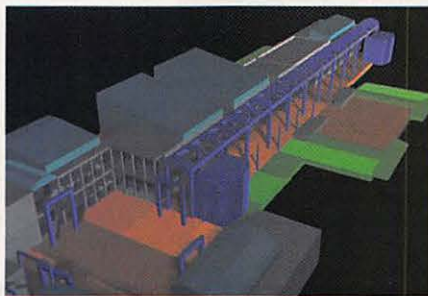
A unique "Linking" feature enables you to design models with constrained mechanical properties. For example, design a ball joint link which permits a component to pivot but not separate. Objects can also be constrained in their range of motion and rotation in order to build hinges, wheels or sliding panels. Create an automobile design with working doors and trunk.

"...I liked using Swivel 3D Professional so much, and found it so straightforward and intuitive, that I almost wished I was a graphics designer and got to do this stuff all day long."

Don Crabb, BYTE

ModelShop II. Why not present your spatial design ideas in amazing 3-D? Architects and designers are pouring it on with this amazing sketch and rendering tool that produces realistic models with incredible speed, pinpoint-precision and remarkable flexibility. Even the most complex models can be constructed using ModelShop II's 2-D and 3-D objects (including cuboids, cylinders, walls, arcs, polygons and more). Light and shadows are completely at your command: adjust intensity, color and add an unlimited number of point and spotlights. Drawing and re-drawing is faster with ModelShop II's Layering — organize your project into an unlimited number of layers to simplify the construction and manipulation of objects. Lock text into place in your models for final presentations.

Design in any perspective or view, with Bezier walls, objects of revolution, linked walls and punched holes. Use unlimited colored light sources, heliodonic cast shadows and more.



Create building exteriors with multiple views.

The prominent San Francisco architectural firm Kaplan, McLaughlin, Diaz have used ModelShop to model a number of large commercial projects, including one design consisting of 1 million square feet. They



Incredible colors, unbelievable resolution and striking output. This example uses stylized and rendered type as part of the design. Images so lifelike, they are real — amazing capabilities.

like ModelShop II because they can visualize and modify the design freely, without committing to hand constructed models or drawings. Rob Morrow of ShowVision, Inc., used ModelShop II to design and model the lighting structure for rock star Joe Cocker. Interior designers Ross & Valentine in Miami use ModelShop II to show clients models of office space designs — then take them on a walk-through tour right on the Mac screen!

ModelShop II includes an extensive library of elements (including many city locations) that can be added to your models in a snap. View models from a bird's-eye perspective, eye-level or just about any perspective you can imagine! Then actually put yourself INTO the model and walk through it!



Rich wood textures, gleaming metal...

Make It Move... Create animated sequences containing a variety of different views, including walk-throughs and fly-bys of your models. Choose straight or curved paths, edit frames, move at varying rates of speed — to explore your models in ways never before possible. Create amazing visual rides through interiors, over walls and around exteriors.

FREE
Multimedia Info Kit
Mini Speakers
Trax MIDI Software

Free Bundle not included on products noted with "" in price box.

MACROMEDIA

BBT2553 Swivel 3D Professional 2.0	\$539.00
BBT2554 SwivelMan (Incl. MacRenderMan)	\$679.00
BBT2555 ModelShop II	\$679.00
BBT2556 LifeForms	\$395.00
BBT2563 Original SwivelArt*	\$95.00
BBT2564A SwivelArt Map Collection I*	\$179.00
BBT2564B SwivelArt Map Collection II*	\$179.00
BBT2564C SwivelArt Viewpoint Car Collection*	\$179.00
BBT2564D SwivelArt Viewpoint Air & Sea*	\$179.00

Pump Out Maximum Speed From Your LC And LCII!

With The Proven Performance of DayStar Acceleration Products...

Universal PowerCache. Combine the blistering speed of a high performance processor (33-, 40-, or 50MHz) with an incredibly fast RAM cache and you've got the industry's most respected time saving enhancement. The award-winning PowerCache accelerates every function (up to THREE times faster) in all applications — including graphics, desktop publishing and spreadsheets. It's the proven 030 performance that beat out all 040 alternatives. And keep in mind, it's guaranteed 100% compatible with all your software and hardware. Can any other board make that claim? One card fits seven different Macs (adapter not required for ILCi). Let's take a closer look: The 33MHz PowerCache offers near-Ilfx performance, while the 40MHz delivers full-Ilfx class speed. But hold on — the 50MHz monster sends your Mac to the limit with

near-Quadra speeds! We tested the hot 50MHz board with Adobe Photoshop, Aldus Freehand, Infini-D and Quark Xpress with results ranging from 225% faster to over 330% faster! Simple to install, just plug it in and hold onto something!

The PowerCache is a second generation CPU accelerator that provides unparalleled performance, 100% compatibility, and easy installation. It's backed by a 3 year warranty and DayStar's 100% Compatibility Guarantee.

Whatever the application, the PowerCache provides huge gains in productivity. It speeds up virtually all functions, plus, it works with everything. So choose the speed you need — all at a price you can afford.

- Super performance for ALL your applications.
- Completely universal/transportable. One card fits them all.
- Available in multiple speeds. You choose the speed you need. Swap-Up as your needs change.

Equalizer LC. For the first time run Apple's System 7 virtual memory. Have all the memory you want... 10, 20, 100 MB or more, all for one economical price! DayStar puts a 16 MHz 68030 processor in your 68020 based Mac LC. The optional math chip is great for complex spreadsheet recalcs and math/science programs.

Special PowerMath software adds even more of a boost to many math functions. Buy today, and you can always upgrade to the blazing fast 50 MHz PowerCache accelerator.

The 68030's built-in memory manager, along with DayStar's proprietary technology, allow the LC to run Apple's virtual memory. Have as much memory as you

want, when you want it.

Inexpensively upgrade your Mac LC to a Mac II class computer.

PowerMath LC. Put a math chip card in your Mac LC — great for complex spreadsheet recalcs and math/science programs. Includes PowerMath software for even greater math performance.

DayStar's Swap-Up Program.

DayStar offers one of the most comprehensive upgrade programs in the industry. Their program provide cost effective paths which allow users to move up DayStar's performance line as their needs change. Owners of the Equalizer LC and PowerMath LC can, at anytime, upgrade to DayStar's award-winning PowerCache family of accelerators.

Buy Any Board And Get 2Mb SIMM Memory Free.

Buy any DayStar accelerator board for super-strength processing power — and Tiger will throw in some room to flex that new muscle! 2Mb's of SIMM memory for your Mac (1Mb SIMM chips with items 2864A and 2863) — FREE!

ACCELERATOR BOARDS

BBT2831A PowerCache 33 MHz	\$785.95
BBT2831B PowerCache 40 MHz	\$999.95
BBT2831C PowerCache 50 MHz	\$1489.95
BBT2831D PowerCache 33 MHz w/math processor	\$999.95
BBT2831E PowerCache 40 MHz w/math processor	\$1199.95
BBT2831F PowerCache 50 MHz w/math processor	\$1779.95
BBT2864A Equalizer LC/Virtual Memory	\$235.95
BBT2864B Equalizer LC w/math processor	\$345.95
BBT2863 PowerMath LC	\$149.95



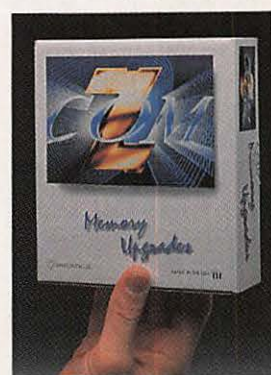
Quality Memory — at Just a Fraction of the Price You'd Pay for Apple Memory!

REVIEWER'S NOTEBOOK: Here at Tiger we love our Mac LC and II computers, but we kept getting "The application could not be opened" and "Application has unexpectedly quit" messages. We found out that the amount of memory they came with from Apple just wasn't enough for the newer applications. So we called Apple and priced out more memory. Wow! We were in shock! \$995 for 4MB of memory! We knew something wasn't right. So we looked for a better way.

Who Needs It? Desktop publishing, high-end graphics, animation, CAD, modeling, and a multitude of other applications demand more memory. Quark cries for at least 8MB (MegaBytes). PhotoShop wants to put up "Out of Business" signs unless it gets 4MB. System 7 demands 2MB all for itself, then you must have some more for your applications. And if those applications don't get what they want, they can be pretty tough characters to work with.

When you try to run an application but don't have enough memory, two problems may occur. If you are really short on memory, the application may simply refuse to launch. The Mac will display a dialog box that says "The application could not be opened." Worse, it may let you open the document but later quit in the middle of the session displaying "Application has unexpectedly quit." Usually you get a warning before you launch telling how much RAM you ought to have versus how much is actually available. If the amount is 75% of the total normally required, you are probably risking an "Unexpected Quit." All of your most recent changes since the last Save will be lost. Ever notice the colors reverse on your screen? That's the way some applications warn you of low memory.

Printers Need Memory Too... LaserWriters use mem-



Z-COM designs, assembles, tests, and packages their memory upgrade products. With a multi-million-dollar assembly facility, including a Class-100,000 Clean Room, all Z-COM products are manufactured using the highest quality equipment under the tightest tolerances and the strictest controls. Everything is double checked, from board tolerance and thickness, to the consistency of the solder paste. Z-COM controls the manufacturing process from the moment the ICs arrive at their facility, through the manufacturing process, up to the final packaging.

FREE BOOK & DISKETTE!

What is memory and why do you want more of it? Order now and get "The Macintosh Memory Guide" from Connectix absolutely free. A simple explanation of memory and how to get the most out of your Macin-

tosh. Packed with tips on making your Mac faster; best explanation of 32-bit addressing mysteries. Includes HyperCard stack on diskette for easy reference. A complete memory guide — FREE! Picks up where your Apple Users Guide left off.

For example: Did you know that RAM is actually a place to temporarily store your data and applications? When you turn off the power — they're gone. Your hard drive or diskette is where you permanently store your files. That's what happens when you "Save" your file. The file is transferred from RAM to the hard drive or diskette.

Are you confused with Apple's explanation of 32-bit addressing and virtual memory? This entry-level guide to high-tech secrets gives you all the facts — in a way that make sense! It's easy and, best of all, FREE! Call Tiger today and let one of our friendly reps help you pack your Mac with lightning fast power.



Z-COM

BBT2835 1MB for SE30, II, Ilx, Ilcx, IIsi	\$59.00
BBT2836 2MB for Plus, SE, LC	\$95.00
BBT2837 4MB for ILCi, IIsi	\$185.00
BBT2838 16MB for ILCi, IIsi, Ilx, Ilcx	\$655.00
BBT2839 4MB for Ilfx	\$180.00
BBT2840 16MB for Ilfx	\$655.00
BBT2841 4MB for LC	\$180.00
BBT2842 8MB for LC	\$339.00
BBT2843 2MB for PowerBook 100, 140, 170	\$135.00
BBT2844 4MB for PowerBook 140, 170	\$259.00
BBT2845 6MB for PowerBook 140, 170	\$359.00
BBT2846 1MB x 8 SIMM Modules 80 ns	\$39.00
BBT2847 2MB x 8 SIMM Modules 80 ns	\$75.00
BBT2848 4MB x 8 SIMM Modules 80 ns	\$129.00

SIMM Modules have a 5 year warranty; all other memory has lifetime warranty; 60ns, 80ns and 100ns RAM also available.



THE INCREDIBLE NEC SILENTWRITER 95

PostScript Power Made Perfect!

The laser-printed page just got a new standard: The NEC Silentwriter Model 95. The new Silentwriter 95 features advanced Sharp Edge technology, for exceptionally black images, without jagged edges. The secret is in the Microfine toner, that can be evenly spread across the entire image or text character. Microfine toner means consistent, pro-quality results for every page.

It's a speedster — the advanced controller benchmark tests at 68,000 @ 16.7 Mhz — delivering 6 pages per minute with full support for PostScript Level 2 and Hewlett-Packard LaserJet III. Supports parallel, serial and Appletalk — with on-board intelligent switching. There's 2Mb of memory, expandable to 5Mb, 35 built-in Adobe fonts and 14 bitmapped and 8 scalable HP fonts. The Silentwriter includes 2 HP-compatible font slots for additional HP font cartridges.

Our tests matched features of the Silentwriter 95, the QMS 410 and the HP LaserJet III: PostScript standard, HP LaserJet emulation, Apple interface availability, number of hot ports, edge enhancement, fax upgradability and feeder features. The results? Surprising. The NEC Silentwriter 95 is over \$500 less than the LaserJet III, \$700 less than the Apple LaserWriterNT and over \$1000 less than the QMS 410! Amazing! The Silentwriter 95 gives you more advanced technology, higher quality materials and workmanship — for up to \$1000 less than the competition. We even dragged in an HP IIIP for Mac, a Texas Instruments Turbo and an Epson 7500 to battle feature for feature with the Silentwriter 95, but they proved to be no match.

The Silentwriter 95 is PostScript Level 2, with full HP III (PCL 5) emulation. Imagine, you can print PostScript and PCL — the Silentwriter 95 automatically switches emulations for you. One printer can handle

your PCs and Macs. It's all here, built right in to the Silentwriter 95. We weren't able to find this combination of features anywhere else at any price. Full-featured PostScript laser technology at an affordable price! The print quality is absolutely perfect. Documents look typeset with the Silentwriter's Sharp Edge technology and Microfine toner.

Print Explosive Color Pages!

The NEC Colormate PS. It's color PostScript at its best.

You will never be satisfied with anything less after you print your first full-color page. Your competitor's presentation will pale by comparison next to your color work. Fast, timely color sell-sheets and promotional materials can be produced in just a few minutes with a Colormate PS.

Rich, vibrant color, approved by Pantone. If you use a Pantone licensed product such as Corel DRAW! or Quark Xpress, you can produce the highest quality simulations for color matching applications. It's a snap to install, simple and reliable to use — even replacing the four-color ribbons takes just a few seconds. Just pop-in a disposable cartridge.

The Colormate PS's extensive support for PostScript technology assures you that it will print perfectly with popular presentation packages. It's a thrill to pull up one of your old black and white screens, colorize it, and print it in color on your new Colormate PS.

FREE! 2000 SHEETS OF RECYCLED PAPER!
With The Silentwriter 95



The Colormate's compact footprint and height help it fit comfortably and stylishly into almost any workspace. Its thermal transfer printhead contains no moving parts and is highly reliable. Built with the quality all NEC products are known for, the Colormate PS makes you, as well as your work, look very brilliant.

FREE! 2000 SHEETS OF RECYCLED PAPER
with the purchase of NEC Silentwriter Model 95
FREE! 2 REPLACEMENT COLOR CARTRIDGES
with the purchase of NEC Colormate PS

NEC PRINTERS

BBT8522 NEC Silentwriter Model 95	\$1545.00
BBT8525A NEC Colormate PS Model 40	...	\$4295.00

Sorry, no returns on these items. Shipping charges billed actual cost.



The NEC MultiSync 3FGx. The designers and engineers went crazy on this one, packing unparalleled features and performance into this amazing new

monitor. Like the new NEC FullScan capabilities and larger screen sizes, where you can see up to 36% more active screen display — without distortion. Its 15" screen is flat, and provides a high refresh rate. That means crisper images, brighter colors, richer tones and more contrast. You'll notice the difference immediately when looking at your desktop! In fact, the 3FGx has been fine tuned for flicker-free images demanded by end users. The new flat-square screen design also enhances the display of single-pixel fonts on your Mac, so even your type will look better.

The NEC MultiSync 4FG. The 4FG revolutionizes monitors in one very important area: color accuracy. This new standard in video excellence is based on the concept of multiple-frequency engineering. And only NEC can do it. The award-winning 4FG is a 15" flat-square screen, digitally controlled monitor that features AccuColor. This revolution allows you to adjust colors to your preferences, or to match your printer's capabilities — even match Pantone and Trumatch colors! Like the 3FGx, the 4FG provides crisp images — 36% larger than conventional 14" monitors!

FREE SPEAKERS
WITH THE PURCHASE OF EITHER THE
5FG, 6FG OR INTERFACE CARDS

NEC MONITORS

BBT2708 NEC MultiSync 2A 13" w/Mac	Connector Cable	\$395.00
BBT2709 NEC MultiSync 3FGx 15" w/Mac	Connector Cable	\$660.00
BBT2710 NEC MultiSync 4FG 15" w/Mac	Connector Cable	\$780.00
BBT8515A NEC MultiSync 5D 20"	\$1899.00
BBT8516 NEC MultiSync 5FG 17"	\$1489.00
BBT8517 NEC MultiSync 6FG 21"	\$3109.00
BBT2715 MacFG 8X Color Display	Interface Card	\$799.00
BBT2716 MacFG 24X Color Display	Interface Card	\$1599.00

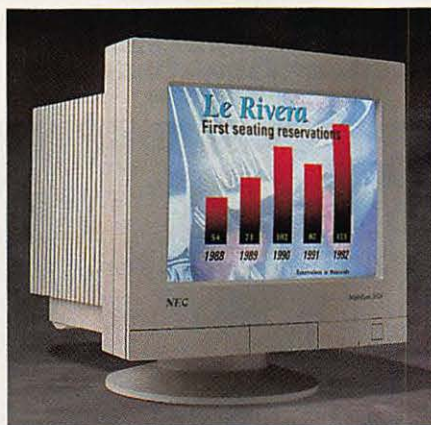
Sorry, no returns on these items. Shipping charges billed actual cost. Shipping on cards only \$3.00 overnight.

Thunderous Color!

REVIEWER'S NOTEBOOK: The advanced new line of NEC monitors is designed specifically for Macintosh users. They are magnificent, introducing flat-square screen, razor sharp resolution and rich color to the world. Faster, brighter screens are a must — without loss of focus. These features are available today from the NEC team of display researchers. The FG Series of monitors are packed with features, enclosed in a sleek cabinet that actually gives you more image area than conventional monitors. Each pixel is defined with unmatched clarity and saturated with color. No wash-out, no blur. The amazing new 4FG provides micro-processor-controlled, digital color. The on-board AccuColor system allows you to match PANTONE and Trumatch colors on screen!

An affordable technological leap? The NEC FG displays are actually less than any of the other pricey nameplates, and deliver more quality, advanced design and performance. How can you possibly beat that? Destined to become "Product of the Year."

monitor. Like the new NEC FullScan capabilities and larger screen sizes, where you can see up to 36% more active screen display — without distortion. Its 15" screen is flat, and provides a high refresh rate. That



The Piano That *Teaches* You How to Play!

I remember being forced into taking piano lessons as a kid. My piano teacher, Mrs. Reymier, was sort of a crabby woman who'd smack my hands with a ruler when I missed a note. During my lessons, fun was the furthest thing from her mind. The repetition, the drills — I eventually quit and I've regretted it ever since. If she had injected a little fun into those lessons, I'd be on tour with The Rolling Stones today!

Now it's my turn to decide on piano lessons for my own kids. I introduced my nine-year-old, a self-proclaimed Nintendo master and junior Mac hacker, to the Miracle Piano Teaching System about four months ago. His first question was "How do I fire the weapons?" Wise guy.

I left him alone with the Miracle and waited to hear something. Ten minutes later I heard Mary Had A Little Lamb, then Chopsticks and then the theme song from The Jetsons. I rushed back to his room and found him with that look on his face — the same look he gets when he reaches a new level in Zelda.

I saw that this thing really works. Today, he's writing his own tunes and getting better each day. He's enjoying music, he doesn't get hit with a ruler and all I have to do is encourage him.

The Only Self-Teaching Piano. The Miracle Piano Teaching System can teach anyone — child or adult — to play the piano with a series of progressive, customized lessons. The Miracle quickly connects to a Macintosh or PC and includes software cartridge that combines an advanced MIDI keyboard with full-stereo sound and brilliant on-screen graphics. In no time at all, students of all ages will learn and perform left and right handed melodies — while having a lot of fun!

There are exercises, musical pieces and drills (cleverly disguised as games), that teach hand positions, notes, fingering, rhythm, scales and more. The Miracle can be quickly set up for any age or expertise, and customizes itself to move the user along at a comfortable pace.

Unlike conventional piano lessons, The Miracle eliminates boring, repetitive routines. The super-creative, artificially intelligent software quickly teaches the basics and builds on them in very entertaining ways. And that makes all the difference.

The Keyboard. Dazzling music! Spectacular effects! Booming orchestras — all created by you — the Miracle keyboard — and a NES. As a stand alone instrument, The Miracle rivals the music industry's most sophisticated MIDI consoles. The 49 full-size keys are velocity sensitive, so you can learn to play utilizing true piano expression. You also get a foot pedal, which controls the length of time each note is sustained and stereo earphones.

The Miracle can produce sounds from its library of over 100 instruments, sounds and effects programmed by a leading motion picture sound designer. To produce its superior acoustics, the Miracle uses sampled sounds, it can be connected to a home stereo system for rich, full sound.

It's Not Just For Kids! The Miracle is a lot of fun and kids all over the world are entering the world of music because of it. But it's not just for kids. The fact is, The Miracle is a breakthrough step in piano self-teaching. If you're an adult and would love to play piano (but think you're too old to learn), The Miracle can teach you with as little effort as it teaches the youngsters. And you'll enjoy it just as much!

It's Not Too Late To Learn... The Miracle is not a toy (but don't tell your kids!). It's so ingenious, it can teach anyone — at any age — how to play piano. The Macintosh and PC software contain exercises specifically designed for

adults, too. You don't have to know anything about the piano, you don't have to read music, and you can have a lot of fun! Normally, adults have a tough time learning something like the piano, but with The Miracle, it's easier because it moves at whatever pace you're comfortable with. If you want to start out learning just one song or melody, you can just work on that, and The Miracle follows you. As you become more comfortable, The Miracle can adjust to whatever method and speed you like.

Endorsed By Educators, Kids And Parents. Everyone loves the new Miracle system. Musical educators love the way it encourages children to practice, making a fascinating game of the piano. And, of course, kids love it because it's not like learning; it's a challenge. Parents love it because...well, what parent doesn't enjoy the sounds of their children enjoying a musical instrument?

The Miracle provides the ability to create over 100 instrumental sounds... **Classical:** Clarinet, Oboe, Strings, Sfx Brass 1, Xylophone; **Rock:** Fuzz Guitar, Stop Guitar, Pluck Synth, Stick Bass, Percussion 1; **Jazz:** Saxophone, Vibraphone, Jazz Guitar, Fretless Bass, Percussion 3; **Blues:** Harmonica, Organ, Steel Guitar, Electric Bass, Percussion 1; **Rap:** Kalimba, Mod Synth, Clean Guitar, Moog; **Latin:** Pan Flute, Marimba, Guitar, Upright Bass, Percussion 2; **Country:** Banjo, Violin, 12-String Guitar, Detuned Piano, Percussion 1.

Here's What You Get Free With The Miracle — Only From TigerSoftware. When you buy a Miracle from TigerSoftware, we'll throw in everything you need to create your own recording studio. We'll start with the Miracle Song Collections, Volumes 1 and 2 containing dozens of popular songs from the Beatles, to Michael Jackson. Play along with your favorite songs, or break out into your own solo. These song collections are a great value and are yours free only from Tiger.

Then we add a copy of TRAX, the MIDI recording software that allows you to create your own smash hits. Change the tempo, mix different instruments, add your own vocals, sound effects and more — controlling it all from your keyboard. The TRAX interface is simple and fast, enabling you to lay down tracks using your Miracle to create your own arrangements.

FREE WITH THE MIRACLE
Everything you see below: Miracle Song Collection Volumes 1 and new Volume 2, TRAX MIDI Recording Studio and Miracle Stand pictured on the top of this page.



As Seen On
"Good Morning
America," "Today
Show" and
Arsenio Hall!

But That's Not All. You also get the Miracle keyboard stand you see pictured at the top of this page. With all this, you'll be ready to create your own live performance or cut your own record.

With The Miracle, you or your child can learn to play without the boring drills and monotonous practice that music usually requires.

Now There Are 40 More Ways of Playing To Learn Instead of Learning To Play! With The Miracle Song Collections, you can add dozens of popular titles to The Miracle Piano Teaching System. All the features that are quickly making The Miracle the most popular keyboard learning method available are fully functional when you use the songs in this collection.

Custom exercises. Video game action. Full monitoring and learning curve analysis. All of it! And best of all, each song is arranged for two levels of playing difficulty: Novice and Expert.

Each volume contains 40 great songs chosen to represent a wide variety of popular musical styles. Rock & Roll. Country. Pop. Rhythm & Blues. Just pick the tune, and in no time at all you're playing it like a pro! All songs are fully arranged so you can hear a complete accompaniment along with your performance. It's like turning a piano lesson into a jam session!

An Instrument That Grows With You. The Miracle is not only an ideal tool for learning, it delivers lasting value as a high-quality, sophisticated musical instrument. With over 100 other instruments available, and a built-in stereo sound system, you can make an entire orchestra come to life whenever you play. As you grow as a musician, The Miracle is compatible with the entire world of modern synthesizers through built-in MIDI connections. (That's Musical Instrument Digital Interface, the worldwide standard for computerized music.) The most amazing educational tool to come along in years.

FIRST TIME ANYWHERE!
MIRACLE FOR THE MAC
TIGER'S GOT IT IN STOCK, READY TO SHIP!
NEW PC AND MAC VERSION!
BOTH INCLUDE FREE HEADPHONES!

MIRACLE

BBT2776 Miracle for Mac	\$349.00
BBT3776D Miracle for PC 5 1/4" & 3 1/2"	\$399.00
BBT3781 K-5 Carrying Case	\$39.95

Create Full 3-D, Photorealistic Images!

REVIEWER'S NOTEBOOK: *MacRenderMan represents the finest software available for 3-D image creation. It is perfect for those who are new to 3-D and for those who have experience with modeling software. Showplace-MacRenderMan gives you an easy way to improve images created with RenderMan compatible modeling applications or to create a dazzling 3-D image using the pre-designed shapes that come with Showplace. With Showplace you just arrange your scene, select realistic appearances for your objects, set your lights and watch the powerful MacRenderMan create your image. Pixar's RenderMan technology was used in the academy award winning film *Tin Toy* and to create special effects in films such as *The Abyss* and *Terminator 2*. Showplace-MacRenderMan gives you access to this amazing technology and you can see impressive results in a short time, but if you get the urge, you can get crazy with these products and never be seen or heard from again...*

MacRenderMan. Fascinating photorealistic design made easy (and fun). Three distinct dimensions in full color, with a variety of surface textures and designs. In our first session, we created several billiard balls with a variety of whacked-out designs and colors in under an hour. That hour passed quickly; the real work was handled by MacRenderMan transparently.

We began the modeling process by describing the objects (geometry and appearance), the characteristics of the lighting (the light sources) and the view we



Give images 3-D beauty and realism.
You'll see vivid colors and rich detail.

wanted of the object (the camera, if you will). We then had a scene! We could change the texture of the surface (and how the light reflects off of it) and easily control the various shading techniques. The more you work on your images, exploring the powerful capabilities of MacRenderMan, the more detailed your images become. This is a great tool for CAD projects, product design, animation, merchandising, architecture and presentation graphics. Nothing else can compare to the images you'll create with MacRenderMan, the most visually accurate picture making product available for the Mac today.

MacRenderMan is used with 3-D design applications that produce RenderMan Interface ByteStream (RIB™) files. Use your favorite 3-D design system to shape objects. The design software will record these geometric descriptions into a RIB file and spool the file. MacRenderMan reads the spooled RIB file and produces a color rendition, computing it in the background under MultiFinder.

Showplace. Showplace is the forum for your objects

created with MacRenderMan technology. Build a dazzling 3-D scene by quickly importing and arranging MacRenderMan images, or choose from the library of Pixar ClipObjects, including furniture, lamps, a sleek racing bicycle, billboard, shopping bag, a theater spotlight and more. Then turn your camera loose and move around your scene to create spectacular effects and perceive a multiplicity of angles.

Change the "look" of an object by changing its surface: you could have an oak grain table and a stucco-painted wall, or a stucco-painted table and an oak grain wall, or an oak grain shopping bag and brushed chrome walls! With Showplace, you can decide the appearance of an object independently of its shape. Showplace's ability to combine any object with any appearance (including those you create) is one of its most powerful features.

These "Looks" include: bricks, brushed chrome, gold and copper, concrete, gray and rose granite, veined marble, natural oak, plastic and sky patterns, among others. Manipulate characteristics such as shininess, size, roughness and reflectivity.

ALSO AVAILABLE IN CD-ROM VERSION

MacRenderMan and Showplace applications, complete online documentation for both products, a gallery of images created with Pixar products and a sample of Pixar animation all on one CD-ROM!

MACRENDERMAN & SHOWPLACE

BBT2410 Showplace & MacRenderMan Bundle	\$599.00
BBT2411 Showplace & MacRenderMan CD	\$315.00
<small>Showplace: runs on any Macintosh II family computer with a floating-point coprocessor, 32-bit QuickDraw, MultiFinder and at least 5 megabytes of internal RAM (8 is recommended); color display system (for full-color viewing, 24-bit is recommended). MacRenderMan: Macintosh II, IIx, IIcx, IIcx or IIcx running Systems tools 6.0.3 or higher; MultiFinder and 32-bit QuickDraw installed; 5 MB of disk storage; 8- or 24-bit color display system; 5 MB of memory (8 MB recommended); RenderMan compatible design package.</small>	

The Only Way to Get Full-Motion Video on Your Macintosh

The VideoSpigot™ Digital-Video Frame Grabber is a revolutionary new digital-video system for making QuickTime movies with the Macintosh LC, IIsi, and all NuBus Macintosh II systems.

The VideoSpigot makes it easy and very affordable to capture full-motion video to disk — up to 30 frames per second with 24-bit color in a 160x120-pixel window when used with a Macintosh IIcx — and embed digital video in interactive electronic publications, product training materials, interoffice presentations, and mail sent over office LANs, among other projects. Unlike other video products, the VideoSpigot turns video into fully digital data so you can store it on an ordinary hard disk or removable cartridge. Part of a complete family of digital video products from SuperMac, the VideoSpigot makes working with full-motion images as easy and intuitive as cutting and pasting text and graphics.

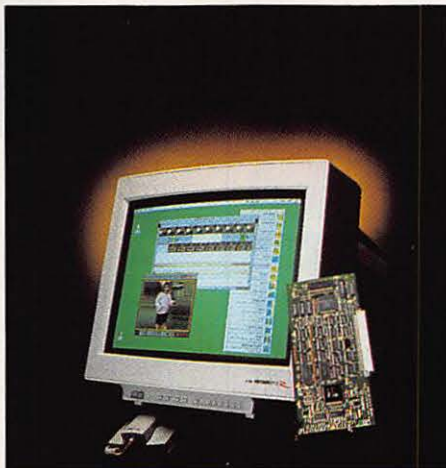
The VideoSpigot integrates all the basic capabilities needed for capturing external video and making QuickTime movies. And its ScreenPlay™ QuickTime Movie Player interface provides easy controls for capturing video source material, trimming video, previewing your footage, storing your footage, storing your QuickTime movies to disk, and playing them back in real time.

Capture Live Video Input. When you connect a VCR, laserdisc, or video camera to your Macintosh, the VideoSpigot captures and digitizes NTSC/PAL input at rates that vary with window size and CPU.

Once in digital form, your video source material is as easy to work with as text and graphics. With QuickTime-aware applications, you can manipulate it frame by frame. You can edit, copy, cut, and paste it.

You can send it over a network. You can store it to disk. You can access it quickly and precisely.

Cut, Paste, and Preview Live Video. Even if you've never put a video together before, you can do it with the VideoSpigot. Just use it with any QuickTime-compatible digital-video editor, and you can combine multiple video clips with graphics, animation, and special effects to produce a complete QuickTime movie. You can also add synchronized audio capture via the built-in sound system in the Macintosh LC, IIsi, and



Capture full-motion video to disk! Store it on an ordinary hard disk! Play movies back in real time for electronic publications. VideoSpigot makes it fast and easy!

Quadra, or on other NuBus Macintosh systems, by using an add-on sound input device.

Video Storage and Playback. The VideoSpigot stores your QuickTime movies to an ordinary hard disk or removable cartridge via state-of-the-art digital compression software. This integral capability compresses video to a fraction of its original size while preserving image quality.

You can distribute your QuickTime movies in compressed form over a network, via electronic mail, or on a removable disk cartridge. For playback, the ScreenPlay user interface automatically decompresses your QuickTime movie and plays it right on your Macintosh. No external video devices are needed. And if you're using VideoSpigot with the Macintosh IIsi, SuperMac's ZeroSlot™ PDS Adapter means you can add more functionality to your system in the future because you don't use up your Macintosh slot.

Compression and Storage

- Stores to and plays from standard disk drives in QuickTime Movie format
- Qualitative compression control to select desired image quality

Audio Support

- Monaural audio input via built-in sound system of Macintosh LC and IIsi at 8 bits, 22 KHz
- Audio synchronized to video
- Compatible with Macromedia Inc.'s MacRecorder, Digidesign's Audiomedia, and QuickTime-compatible audio digitizers

VIDEO SPIGOT

BBT2478A VideoSpigot SI	\$339.00
BBT2478B VideoSpigot LC	\$339.00
BBT2478C VideoSpigot Pro SI	\$1299.00
BBT2478D VideoSpigot Pro LC	\$1299.00
BBT2478E VideoSpigot Pro NuBus	\$1399.00
BBT2478F VideoSpigot NuBus	\$389.00

Call for system requirements.

New! WriteNow Version 3.0!

REVIEWER'S NOTEBOOK: WriteNow is the word processor Mac aficionados swear by — it's fast, compact (requires just 325K), reliable, and brimming with great new features that give every document an absolutely stunning look. NEW! Paragraph and character style sheets help you create a clean, consistent look. NEW! An incredible print preview that displays thumbnails and facing pages — optimized for your particular screen's size. NEW! Color text and graphics, along with new styles and graphics capabilities. NEW! One-step default document creation — just throw in the text and out comes a masterpiece.

If you're a Word user, just try WriteNow 3.0 and see what you're missing. From page layout and design, graphics and document management to printing, System 7 support and great style sheets — WriteNow is the most robust word processor for the Mac. It just feels so nice. The columns snap to attention as you enter text, the headers and footers pop into exact position, the formatting and style sheets are crisp and professional — and WriteNow

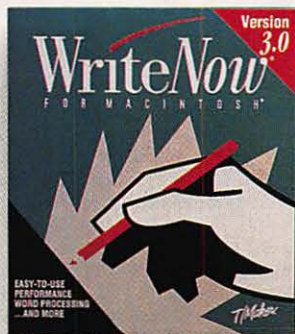
contains a giant 1.4 million-entry thesaurus, a 135,000 word spelling dictionary with ultra-convenient Auto-Find and Auto-Guess spell checking. WriteNow is compatible with other leading applications such as Microsoft Word, Works, MacWrite, PageMaker — even the PC version of WordPerfect...

Includes FREE — FaxMania, another smash hit from T/Maker, 80 great fax cover-sheet templates that are ready to use, right out of the box.

The Lean And Mean Word Processor. WriteNow has swept the industry, collecting Editor's Choice awards and other top honors. Known for its incredibly swift performance and compact size. But despite the lack of size, WriteNow contains a complete set of state-of-the-art features.

Styles are available for virtually any type of document. Quickly add horizontal lines with dozens of different line widths and pattern fills. WriteNow performs graphic scaling (proportional and nonproportional), positions graphics vertically in a line of text (nice effect), and more.

Document management is a WriteNow long suit. A handy Clean Up command organizes your window in a snap — and the last two document iterations are automatically saved for you. Printing is also sleek and intelligent. WriteNow's optimized LaserWriter character spacing delivers a clean, designer look. Print all pages, just odd pages, just even pages — or print any of them in reverse.



WriteNow is perfect for everyday letters, memos and reports. Easy-to-understand menus are the key.

What About System 7? Sure, and a lot of those 60 new features unleash the potential of System 7. You get 32-bit addressing, Virtual Memory, TrueType, Apple events, Alias support, Colorized icons and Balloon Help.

Here's What's New In WriteNow 3.0.

Paragraph & Character Style Sheets. Easy 'point-and-shoot' design. Variable family hierarchy. Readable definitions. True character styles (partial, transparent, and opaque settings).

FREE

with the purchase of WriteNow Version 3.0

RightWriter, Desk Reference, Word Finder, Elements of Style And The Amazing Acta 7 Outliner!

A \$500 SOFTWARE VALUE!

80 Fax Cover Sheets!

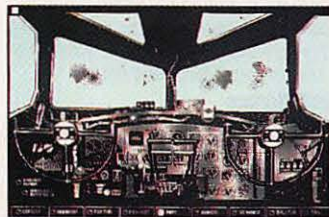
A fax cover sheet for every mood; every situation. A friend or associate's birthday? Send a birthday fax! Got a big announcement? Shout it out — with a customized fax sheet! Get serious and fire off an urgent fax. FaxMania is a

smash hit, with 80 great cover sheet templates, each professionally designed and ready to fax. Includes cover sheets for travel itineraries, international faxes, invitations, news flashes, a "Faxes From The Outer Limits," a romantic "Flower Fax," thank-you faxes, ordering-from-restaurant faxes, and our favorite: "A Fax Called Wanda."

WRITENOW/FAXMANIA	
BBT2020 WriteNow	\$179.95
BBT2021 FaxMania	\$29.95

Gut-Wrenching WW II Airborne Action! You And Your B-17 Crew Fly A Pre-Dawn Raid On Nazi Germany...

REVIEWER'S NOTEBOOK: Two Rene Vidmer classics, recreating the great air clashes in the history of warfare. Bomber is not a wimpy flight simulator or silly arcade slugfest, it is an intensely realistic action-adventure that takes you and a young B-17 crew on 25 missions over Nazi-occupied Europe. Your plane, a seasoned Flying Fortress and your ten man crew communicate during one of the most vicious campaigns of the war.



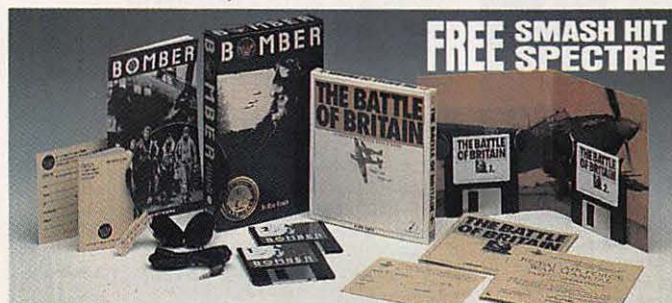
Just you, a 10-man crew, and a Flying Fortress named "Naked Lady."

Great animated sequences keep you in the heat of the action, as you descend on a Magdeburg oil field.

The Battle of Britain is the historically accurate situational game of strategic skill and military instinct. The year is 1940, over the skies of Britain, the relentless Nazi air assault continues. You track incoming raids using radar screens and ground observer reports. You evaluate your resource of men and machines to carefully plan your missions. It's you versus the uncanny ability of the German Luftwaffe — are you ready at any moment to scramble pilots to their mighty Hurricanes or legendary Spitfires?

DEADLY GAMES

BBT2870 Battle of Britain 2.1 (Color)	\$35.95
BBT2871 Bomber 2.2.5 (With Headphones)	\$32.95



FREE SMASH HIT SPECTRE

The Ultimate Audio System For The Mac!

Apple makes great computers, but they're not in the speaker business. That tiny internal speaker is fine for beeps and gongs, but for high-quality audio, especially for dramatic presentations, it falls a little short. The audio specialists from Persona

Technologies have devised a powerful speaker system, capable of reproducing the full range of digital sounds. MacSpeakers are incredible. You'll hear clean sounds and have complete control of volume, bass and image to enhance definition of the sound from your CD-ROM, Laserdisc and MacRecorder. Deluxe and Micro sizes available.

These fine speakers use a unique Sonic Imaging Control technology, that creates stereo voices, music and effects — even if your Mac originates a mono signal! Add the magic of brilliant sound to your presentations. Simple to install, they slide right onto the side of your Mac. Turn them on and — boom! —

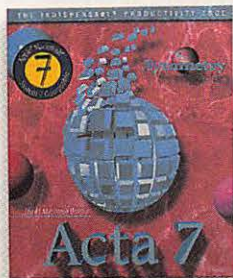


you're pumping out studio-quality sound. Great for Mac composers and musicians, Multimedia, CD-ROM, Game freaks, Mac-based voice applications, studio pros and presentation innovators.

PERSONA SPEAKERS

BBT2855 Deluxe Speakers	\$170.00
BBT2856 Speaker Tripod Set	\$29.95
BBT2857 MacSpeaker Standard Stereo Mini to 2 RCA Y-Adapter Cable	\$19.95
BBT2858 MacSpeaker Standard Stereo Mini Extension Cable	\$9.95
BBT2859 Carrying Case	\$24.95
BBT0000 Micro Speaker	\$69.95

Two Words To Success: OUTLINE & ORGANIZE



REVIEWER'S NOTEBOOK: *Outliners are fast becoming a standard in today's office environment. While word processors evolve into desktop publishers, outliners have become a vital tool that turn shadowy thoughts and ideas into focused plans of action. Acta 7 is the industrial-strength thought-processor that*

stands heads & shoulders above the rest. Here at Tiger we can see how it earned its reputation as "the easiest-to-use thought processor for the Mac".

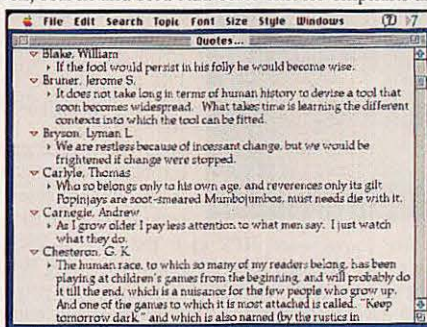
If you're still using a word processor to gather and organize your thoughts — think again. This is the breakthrough of the 90's. Outliners are ideal for capturing quick, fleeting brainstorming before they can get away. I always keep Acta 7 running in the background. Bright idea? Click — it's instantly noted. When I'm ready, I review my notes and organize them. Rearranging, grouping, evaluating importances and so much more. That's the power of Acta 7. It processes my thoughts.

Outliners are better than word processors for developing concepts, plans, letters and so much more. With its built-in hierarchy of levels and sub-levels, it's easy to rearrange various parts to really fit. The important items bubble to the surface while subordinate ones fall

into perfect place. We find using an outliner a time-saving tool for all our writing. It's simply better-suited for the task than any word processor, but that's only the beginning.

Acta 7 takes full advantage of System 7, including sound! Pick up your mic and record a voice message right in the middle of your document. It really does give that extra degree of impingement. Dial a phone number directly from your telephone list, or Publish & Subscribe with other applications and users. I use Acta 7 to maintain notes of Art Department projects, then link them to schedulers in use by others in the department. It really keeps us working together and moving in the same direction.

Rich in word processing features, Acta 7 lets you mix type styles, set page breaks, customize outline labels, search and sort. Add color text for emphasis and



Outlines are made for organizing thoughts and evaluating importances. And Acta 7 is Mac's finest Outliner.

TrueType fonts for sharp, clean text in any size. Import and export to every major application, including Microsoft Word, WordPerfect and MacWrite. Acta 7 is the perfect partner for today's word processors. But it's also capable all by itself.

Better Than Word Processing. If you need a place for recording and organizing your thoughts, your day, your project, your presentations — Acta 7 is for you.

Start with random ideas and arrange and rearrange them in a hierarchical order that works for you. Suddenly things fall into place.

Now include sound as well as graphics in your document or desktop presentations. Acta 7 is truly a multimedia tool.

Dial a phone number directly from your telephone list. Customize forms and save them as *Stationery*. Your outlines become more and more useful.

With *Publish & Subscribe*, information can be shared with other applications and other users. Acta 7 outlines become dynamic "work in process" documents.

And... Acta 7 is easier than ever to use. System 7 users will find Balloon Help at each menu and dialog box, and full access to a wide-range of features.

The Outline Is The Key... An outline is a dynamic document. As it matures, new relationships become evident and can revise your original outline structure.

By changing an outline's form you can view the subject from various perspectives. To get a general picture, you might want to see just its main topics. To study the outline's structure, you might want to expand it, but view only the first line of each topic. Finally, you might want to expand the outline completely, to get a broader view.

Acta 7 is the right tool at the right time. Perfect for turning thoughts into organized documents.

ACTA 7

BBT2066 Acta 7 \$69.95

The First True MultiMedia Manager!

REVIEWER'S NOTEBOOK: *Another superior product from the makers of Acta 7 is Mariah — the world's first multimedia organization and retrieval utility. Desktop graphics and multimedia are exploding at a phenomenal rate. You do things on your Mac unheard of just a few years ago. But what about organization? What do you do with all those files, and how do you keep them organized — yet retrievable? Mariah is a heaven-sent tool for every graphics operator. We put all our files in one Mariah "Collection". Now, to find a file we just enter a keyword or two for instantaneous searches, or pull up full-color thumbnails for visual browsing. Finding images we haven't touched in years is now easy and fast.*

Mariah lets you manage graphics, sounds, animation, text and more. All in one easy-to-use file. All easily retrievable — fast. All types of files, from B&W to 32-bit color Paint, PICT, PICT2, TIFF (Mac or DOS), EPSF (Mac or DOS), as well as Scrapbook and PictureBase formats.

And when you find that special file, what do you do? Listen to sound files, play animation files, cut and paste graphics, convert formats and more — all from within Mariah.

Build huge collections of mixed "stuff" that can be sorted, gathered and retrieved at

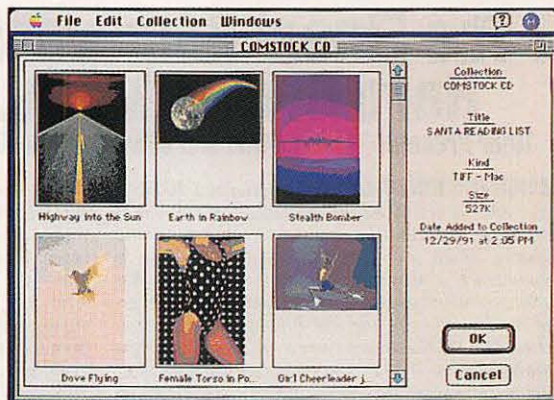
amazing speeds. How fast? You can search through one hundred megabytes of 3,000 items faster than you can say, "Searching Mariah Collections is bullet fast!"

You can routinely work with 90 to 100 megabyte Collections. Just dump it in and let Mariah go to work. The Boolean search (using AND, OR and NOT functions) screams through hundreds of megabytes and infinite items in seconds. Enter partial words such as "Chr.." to find "Christmas" or "Christmas Trees".

We love the full-color thumbnails. Last week we had an emergency. We had to find a particular scanned image of a red racing car — fast. We dumped all our images into Mariah. Six thumbnails at a time, we browsed through our collection at a very rapid rate. Bingo! There it was! But from now on, we're going to enter keywords as we save our images so we can use the super-fast, automatic searching functions.

Mariah is a must for anyone in the graphics or multimedia industry. As time goes on and various types of files accumulate in ever-increasing numbers, Mariah is the one tool to keep them all organized. Mariah lets you instantly find that special file you otherwise would consider lost forever.

- Up to 32,000 items per Collection with multiple Collections open at once.
- Search by name, type or unlimited keywords.
- Unlimited Boolean search & filter.
- Works over networks and file servers.
- Converts file formats i.e. EPSF, Paint or PICT to TIFF and back.
- Also imports and exports PICT & Sound Resources.
- Print



Instant full-color thumbnail viewing! Scroll through Collections page by page or view rows of thumbnails all at once. Sound clips, animations, and mixed graphics can be viewed in the same Collection. Click on any item for information or double click to go instantly to the actual file.

images or play items as slide show — including sounds and animations. • Import all types of graphics. • Clip and paste or record sounds directly to a Collection. • Collection size limited only by hard disk size.

Find Anything In Seconds! Search for items by name, type, or unlimited keywords. Thousands of items can be found in seconds! Mariah works over networks too. Never lose a piece of art again. Quickly gather new Collections of associated art, text, sound and animation items.

Supports Popular Networks. Since Mariah works with Appleshare and other network software, you can search all the Collections on your file server, or hard disk on the network.

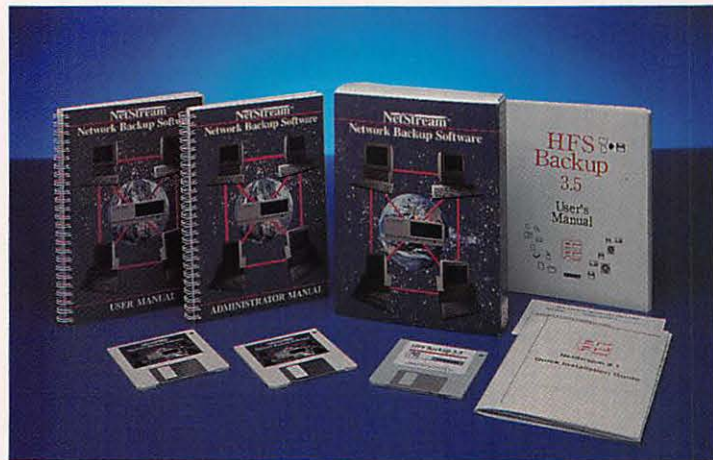
MARIAH

BBT2065 Mariah \$79.95

Galvanize Your Data...

With Advanced Backup Technology!

REVIEWER'S NOTEBOOK: Two advanced backup utilities from the masterminds, PCPC. NetStream for unattended network backups and HFS Backup for your home or desktop Mac. The "Set-It-And-Forget-It" backup technology with 100% reliability.



HFS Backup is compatible — from System 6.0.4 right up through System 7.0.1 Quadra. Back up any amount of data you can mount on your desktop. Backup to any type of backup media: high density floppies, removable media cartridge drives and even many tape drives. It's got Fort Knox safety features and on-

board virus protection.

NetStream is for the high-flying Mac network. It's well designed, very powerful — and COMPLETELY AUTOMATIC! Unattended network backups are scheduled in advance and it works on any AppleTalk network without special hardware or software. And full live-server backup can be performed without shutting down the server or network. Backup all users on your network, just select devices — or select multiple zones. Backup across a network to tape, optical and other storage devices.

HFS Backup... The Pros Depend On It.

HFS Backup is the choice of information professionals, delivering fast, 100% safe backup protection for just about any type of backup media. Besides mounted volumes and high-density drives, HFS Backup supports most popular tape drives including PCPC JetStream, PCPC DATstream, Apple 40SC, Archive Viper 150, and Archive Python, GigatrendDAT and WangDat. No other backup software combines vast compatibility and rock-solid performance like HFS.

For convenience, HFS wrote the book, enabling you to quickly back up just the files you need. Why back up your entire volume of files when only two or three have changed since your last backup? Choose from a wide range of criteria: date, type — even files created by a certain application.

Security. An HFS Hallmark. Safeguarding your data is critical. Don't find out the hard way. Trust HFS Backup's fail-safe security system... one of the most sophisticated in the world. Complete password protection and DES encryption of your backed up files.

Another aspect of data safety is virus protection. HFS Backup has been combating virus attacks for years. Their innovative technology offers protection against unknown viruses — your virus protection software CAN'T DO THAT!

Complete AFP compatibility means HFS Backup will retain all file and folder access privileges on your AppleShare or AFP server.

NetStream: The Network Backup. Network backups made painless and easy with new NetStream. Before NetStream, network backups were impossible. But with ingenious new breakthrough technology — network backups are automatic! Just set-it-and-forget-it. No more worry — no more missed backups. Schedule in advance, then you continue to work uninterrupted — and all data current and safe across the network. NetStream works on any Mac and is System 7 Savvy.

NetStream enables to backup AppleShare file servers without being logged on! Administer your network easily and conveniently. Grab the Server Folder (containing the Users and Group information and all File & Folder privileges). All this without having the server mounted!

Real Time Backups. Using NetStream's Stealth mode, network users can be backed up even while running applications with little or no impact on network users productivity. That's a first — and it will save you hours and hours of precious time.

PCPC BACKUPS

BBT2535 HFS BackUps	\$59.95
BBT2534A NetStream Administrator	\$199.95
BBT2534B NetStream One Node	\$59.95
BBT2534C NetStream 10 Pack	\$199.95

The Finest Removable Hard Drives Made.

Tiger Presents The PLI 44Mb And 88Mb Cartridge Drives

REVIEWER'S NOTEBOOK: Highly acclaimed, 100% reliable and backed by a solid warranty, the PLI line of removable cartridge drives is the most respected in the industry. When your files and applications grow to monumental size, when you want to perform fast backups or when you want to take heavy megabytes on the road — there're the PLI Infinity 44 and 88mb drives. The PLI Cartridges carry a full 5-year warranty. One other note: The PLI drives and cartridges are thoroughly tested, far exceeding industry standards, so when you install a PLI, you're ready to go.

With much of the design and layout work done at TigerSoftware on Macs, our PLI cartridge drives are critical to a smooth operation. Without their reliable service and unmatched speed, getting our hands on files would be nearly impossible. Our choice: the PLI Infinity 88 Turbo drive. This remarkable instrument carries a 60,000 hour MTBF (Mean Time Be-

tween Failure) rating. That's over 6 years between down time! It features the highest level of filtration, quality-engineered circuitry and is virtually impossible to damage by incorrect cartridge insertion (a leading cause of drive failure).

Designed and engineered for rugged use, the PLI Infinity 88 Turbo has the industry's highest tolerance to non-operating shock (our 88 Turbo once survived a four-foot fall onto a tile floor).

Of course, you'll get all the features that have made PLI the name asked for most when it comes to removable cartridge drives including external switches for termination and SCSI address, UL-approved, individually tested power supplies, long-life 50-pin Centronics SCSI connectors, an external fuse and (unlike other drives) you get the complete kit, with all necessary cables and accessories. The Infinity 88 Turbo beats Bernoulli hands down when it comes to price, performance and value.

Standard of the Industry. One of the most popular uses of removable hard disks is in the graphics business. When you're working with a scanned image that's a gigantic 20mb in size and you need to take it down to the local service bureau for processing, you don't want to fool around with slow, cumbersome floppy disks. And you don't want to spend hours trans-



**PRICES DRAMATICALLY SLASHED!
ON THE BEST DRIVES IN THE BUSINESS...**

ferring the file over the modem either. (The file transfer usually aborts somewhere after the first hour and needs to be resent.) What this job calls for is a removable hard disk. And that's just what the graphics industry has standardized on. But not just any removable hard disk — PLI-compatible removable hard disks. (PLI uses high-quality SyQuest drive components.) Over 80% of all service bureaus and other graphic shops use PLI-compatible drives. So you can take your removable hard disk almost anywhere for file transfers. (Plus the added advantage of having somewhere to go in case of an emergency such as a computer failure.)

PLI DRIVES & CARTRIDGES

BBT2460A Infinity Turbo 88mb Removable Single External Drive	\$799.00
BBT2460B Infinity Turbo 40mb Removable Single External Drive	\$599.00
BBT2465A 88mb Cartridge (Unform., 1-yr. war.) ..	\$139.00
BBT2465B 44mb Cartridge (Unform., 1-yr. war.) ..	\$79.00
BBT2465C 88mb Cartridge (Format., 5-yr. war.) ..	\$149.00
BBT2465D 44mb Cartridge (Format., 5-yr. war.) ..	\$89.00

Sorry, No Free Shipping.



Upgrade to 1-2-3: Just \$69⁹⁵!

After
Electronic
Rebate

REVIEWER'S NOTEBOOK: *The thoroughbred of Macintosh spreadsheets. Not a step-child of the original DOS product, Lotus 1-2-3 for the Mac has been designed from the ground up to exploit the power and flexibility of the Mac. Revolutionizing financial software with true 3-D worksheet capabilities: Excel doesn't have it, Claris Resolve doesn't have it. Fully featured, with System 7 support; completely customizable with desktop tear-off menus, most functions require just a mouse click. Excel users will be surprised at the power and grace engineered into Lotus 1-2-3 for the Mac.*

Designed Specifically For The Mac! One of the first things you'll notice about new Lotus 1-2-3 for the Mac is how beautifully it compliments the functionality of your Mac — especially on Apple's hot new System 7. That's because the engineers at Lotus went back and started from scratch to design and build a spreadsheet that not only gave Macintosh users the ability to have the power and grace of 1-2-3, but to have it perfectly suited for the Mac interface. New Lotus 1-2-3 for the Mac gives you everything — tear-off menus, great graphics and the entire spectrum of powerful features that have made Lotus 1-2-3 the most popular spreadsheet in the world. But Mac users are lucky! Lotus has given them some new features that make 1-2-3 for the Mac the only spreadsheet you'll ever need — or want — to use. In fact, we've prepared a head-to-head evaluation of 1-2-3 vs. Microsoft's Excel for the Mac. If you're an Excel user, the results will overwhelmingly convince you.

1-2-3 for Macintosh contains true 3-D power — it's not available anywhere else. Imagine working with up to 256 worksheets at once! Or in-cell editing — there's an amazing bit of programming! It'll save you hours! Excel doesn't give you relational query power or the ability to compress files for printing. Sorry Excel...

Start With The Desktop... It is magnificent. All the tools you need for spreadsheets, budgeting, analysis, graphics and forecasting are right there, ready to spring into action. Your data, your graphing tools, text, style palette and drawn objects all reside in a single document, with the same menu structure. You move effortlessly between tasks and functions for enjoyable, productive work. Just click to highlight a range or create a chart. Enter data in a snap, create and run macros... all elements are live and at your fingertips. To move graphs, just click and drag! Change data in your spreadsheet and 1-2-3 updates your charts instantly! Directly manipulate any element of your worksheet without moving in and out of menus. Since all of this incredible financial activity takes place in your worksheet, you can even change data, text and formulas directly in a cell. This "In Cell Editing" will save hours of time, eliminating the need to move out of the worksheet to make revisions.

True 3-D Power. No other Macintosh spreadsheet gives you 3-D spreadsheet power. 1-2-3 for the Mac breaks the barriers of the third dimension and allows you to easily take a handful of individual spreadsheets, line them up right on your screen and work through them just as you would in traditional 2-D fashion. All of a sudden, tricky consolidations become a breeze — no dialog boxes of linking required.

You can instantly combine up to 256 worksheets — layered together into a single document! Complex models are a snap with 1-2-3 for Macintosh, because all data is live and ready to link.

This is 3-D muscle that Excel doesn't have!... Since formulas are the name of the game, 1-2-3 for Macintosh

allows you to create formulas across multiple spreadsheets — and it's click and drag easy! For example, you could set up individual worksheets for each commission-based sales staffer. Quickly view and calculate who sold what — and when. Then for summaries, you can easily create formulas across all employee worksheets with just a couple of more clicks.

Customize Your Desktop The Way You Want It. While other spreadsheets require you to adhere to rather rigid structures and screen layouts, 1-2-3 for the Mac was designed by people who understand the need for everyone to work the way that's best for them. You're the boss! Quickly set-up your own tear-off menus for one-click access to worksheet commands. If you need several types of arrows for use in a worksheet, just tear off the ones you need from the main menu and keep them on your desktop. Move your Icon Palettes anywhere you want. There's also a very clever feature that allows you to pop up a Classic 1-2-3 menu (of familiar PC vintage).

Beautiful Graphics To Create Handsome Spreadsheets. With the heart of a Mac, Lotus 1-2-3 for Macintosh makes sure your output is crisp, professional quality. The charting features are fast and powerful, so you just click to create amazing 3-D pie and bar charts — along with several other types of expressive charts. If your pie chart just isn't quite right, just click and see how the information stacks up as a stacked bar chart, or a scatter diagram. Once the chart or graph is created, any change in data is updated on the chart. Dress up your charts with some color — with just a couple of clicks — or add a border and change type style. Just a click does it.

All The Goodies... With System 7 support comes full support for Publish and Subscribe, Apple Events, the Data Access Language, Balloon Help, Virtual Memory and of course, TrueType.

The Beauty And The Beast... The first time you work with Lotus 1-2-3 for the Mac, you'll notice the sleek

beauty of its interface, its dazzling graphics and its heart-stopping graphics. But that's not all you'll notice. Under that gorgeous face is a heart of bone-crushing power. For example, 1-2-3 for the Mac will allow you to easily draw information from outside databases — directly — and work with that data as if it was part of your worksheet. Nobody else gives you that kind of brute force. It's a bit of advanced technology known as Data-Lens — developed by Lotus.

Free Adobe Type Manager.

Your spreadsheets will look great on-screen — and on paper. 1-2-3 for Macintosh includes Adobe Type Manager absolutely FREE! Your fonts will look great — better than true type fonts! Nobody beats Adobe when it comes to font technology. And ATM automatically down loads softfonts (or any other fonts that reside on your hard disk).

What's more, 1-2-3 Macintosh includes 9 FREE typefaces perfect for spreadsheet publishing.



FREE! ONLY FROM TIGER CheckFree

When You Buy Lotus 1-2-3 for Macintosh

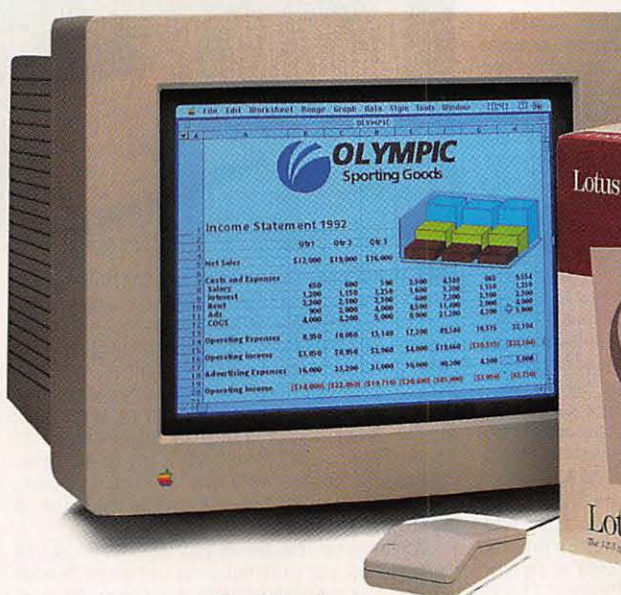
Now you can pay your bills electronically — via modem — regardless of which bank you use, or who's on your payment list. CheckFree uses its built-in telecommunications program to handle payments through the Federal Reserve System for 100% safety and reliability. And with CheckFree, you'll pay all of your bills in about ten minutes! That's it. No checks! CheckFree keeps an electronic check register for you and works seamlessly with financial management software like Quicken and Managing Your Money. **A \$29.95 value. Yours Free!**

ORDER YOUR COMPETITIVE UPGRADE TODAY!

If you are a current 1-2-3 user, you are automatically eligible. If you use Excel, Claris Resolve or another competitive spreadsheet, you too are eligible.

ALSO FREE WITH 1-2-3 — DYNOPAGE

DynoPage is the amazing print utility that prints any Macintosh page to any size or any configuration.



Why use anything else? Tiger's bending over backwards to introduce you to the finest spreadsheet technology in the world — with a **\$69.95 Upgrade Price!** After Electronic Rebate.

LOTUS 1-2-3 MAC

BBT2485 Lotus 1-2-3 Mac \$325.00
BBT2486 Lotus 1-2-3 Mac Upgrade \$99.95



Keep Schedules in Sync with Mac's Best Calendar

REVIEWER'S NOTEBOOK: Computerized calendars have been with us for a long time (they're a natural for any computer), and I've seen more than I can count. So when one comes around that's really heads and shoulders above the rest, it's something to get excited about. It started out as a project at Claris Corp., moved on its own to Now Software (makers of the popular Now Utilities), and finally culminates in Now Up-to-Date — the only calendar that keeps your appointments and your associates up-to-date, in the office, at home, or on the road.

Now Up-to-Date reminds me of important appointments (even when the application is off and I'm only running my spreadsheet). It shows me daily, weekly, monthly and yearly views that make visual sense. It even lets me take my PowerBook on the road and make schedule changes for both myself and my associates, and when I return to the office, it automatically updates both my personal and the centralized Public calendars — that's smart.

The goal was to combine the timeless functionality of the appointment calendar with the power of the Mac. To take the age-old appointment/calendar book, which people instinctively know how to use, and place it on the screen, infused with powerful capabilities that simplify as well as automate. That's a relatively easy task when talking about power and new features — practically any professional programmer can do that. The hard part is to make it really useable. To make it easy enough and intuitive enough for a novice to sit down and really use it. After all, who wants to have

more attention on keeping their schedule than absolutely necessary?

That was the star high goal, and it's our privilege to announce the goal's finally been reached. Introducing Now Up-to-Date, the premier calendar tool that's both powerful enough to fully schedule any individual or group, plus straightforward enough to be easy-to-use and intuitive for every user.

From the unique "Public Calendars" that coordinate your schedule with your associates' schedules automatically, to the powerful "Reminder" feature that notifies everyone about a meeting far enough in advance to ensure everyone shows up on time, Now Up-to-Date is one-of-a-kind software you can't do without. Check out what Now Up-to-Date can do for you...

Even with the new PowerBooks, there are still times when the old-fashioned, printed appointment (on which Now Up-to-Date is based) best serves the purpose. That's when you'll love the printing options with all the popular appointment book formats like DayTimer, DayRunner, Franklin Planner and FiloFax. Plus you can print your calendar in a variety of other formats.

Customize Your Calendar. Now Up-to-Date's flexible Views and Styles let you customize your calendars, so you can see and edit them any way you want.

- View a day, multiple days, a week, multiple weeks, a month, multiple months, or a year at-a-glance
- Edit any event in any view
- Draw extra attention to big or important events with Electronic Sticky Notes and colorful Banners
- Control how many hours are displayed per day
- Create (and easily switch among) multiple style groups
- Display multiple views of the same calendar at the same time



Organize Your Appointments. Now Up-to-Date's unique "Public Calendars" coordinate your schedule with your associates' automatically, so your left hand can know what your right hand is doing.

- Combine related calendars into custom groups (create a Social Calendar by "subscribing" to the Holidays, Parties, Birthdays, and Vacation calendars)
- Filter out information you're not interested in
- Assign different colors and text styles to events from different calendars to make them more identifiable
- Run the Public Calendars server unobtrusively in the background on any non-dedicated Macintosh on your network
- Import events from other calendars, personal information managers, or any other source of tab-delimited text

NOW UP-TO-DATE

BBT2108A Now Up-to-Date	\$65.95
BBT2108B Now Up-to-Date 5 User	\$265.95
BBT2108C Now Up-to-Date 10 User	\$395.95

The Total Organizer Solution For \$99.

Buy The Amazing Dynodex And Get DynoPage FREE!

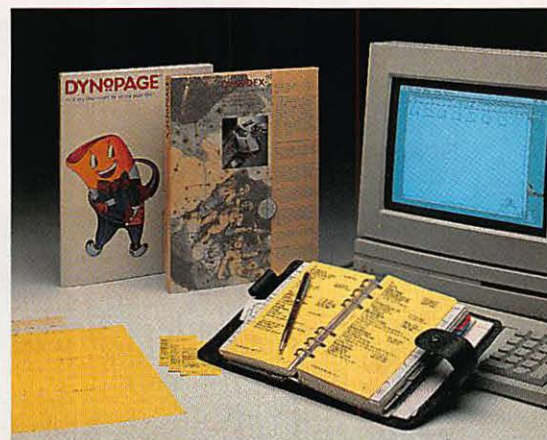
Dynodex is a true personal organizer, capable of handling names, addresses, phone numbers, notes and all other important information — and allows you to print perfect double-sided address book pages that fit virtually any personal organizer.

You'll now have instant access to your personal contacts both on and off the computer. At your computer, instantly look up and dial any number you need from the powerful Dynodex application — or the convenient desk accessory. On the road, all of your contacts are available in your personal organizer. Now your contact information is personal and portable.

The powerful Dynodex database delivers ultra high speed searches: instantly select subsets based on multi-level queries with a set of eight logical and arithmetic operators; for example, "all clients in California contacted within the last 6 months." On sorting: you get 3-key, ascending or descending on any field, along with Dynodex's speedy find, change and global delete. You can delete duplicates, Fast-Find and display any record instantly by simply clicking on it in the list window.

If your information resides elsewhere, Dynodex allows you to quickly import it for immediate use. Any text file, tab-delimited or comma-delimited file is ready to use, and Dynodex includes a free copy of DynoStack, for importing HyperCard, Focal Point and Quick-Dex address files.

On to Dynodex's powerful (and very smart) printing capabilities: You can print any size address page, even double-sided pages. Print in any font, size and style on a field-by-field basis for great pages.



FREE DynoPage. This amazing printing utility allows you to print documents at reduced sizes and on both sides of the paper. Double-sided pages are much easier to print using DynoPage, and can be printed to any size from full-size letter, legal or tabloid, to "photo-retouched" sizes for personal organizers such as DayTimer, Day Runner, FiloFax, Franklin or any custom size you want. Just drop-and-drag to print from the Finder! They couldn't have made it any easier. DynoPage comes complete with over 100 built-in layouts, and prints text in any font, size or style that's used in the original document.

Anything you can get on your Mac screen can be printed in any size or layout using DynoPage. In addition to 1-2-3 spreadsheets and charts, you can print word processing files, presentation pages, database files and more — to any size you like.

You can even print your spreadsheets to create great little "fold and staple" booklets, or print reduced versions of your spreadsheets on larger sheets to use as

handouts during presentations.

DynoPage prints in a variety of useful configurations, and comes complete with 40 sheets of Dynodex Instant Address Book Paper (six-ring along with half-page), dozens of pre-designed layouts, a comprehensive manual brimming with tips and techniques and a valuable coupon for big discounts on personal organizer products. Here's a look at what you'll be able to create with DynoPage:

Dynodex 2.0 Wins MacWEEK Target Award

Editors Call It "Best Overall Choice"

In choosing Dynodex 2.0 as an award recipient, MacWEEK's editors wrote: "Dynodex significantly edges out the competition in performance, especially with larger address lists. The program's strong points include a streamlined interface, complex phone-dialing capabilities, versatile import and export features, and a thorough and well-written manual. Unparalleled printing versatility, including address books, labels, envelopes and rotary-file cards.

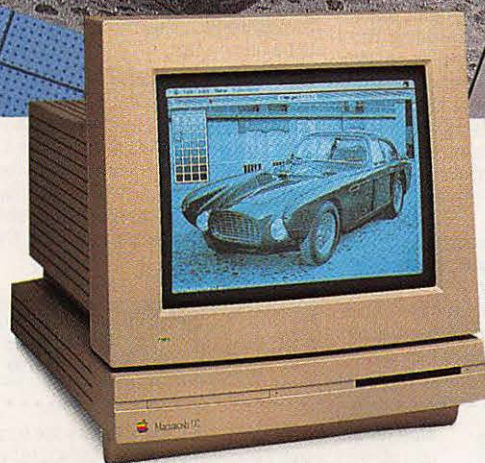
TIGER EXCLUSIVE!

Dynodex w/Free DynoPage and a package of DynoPaper of your choice.

90 day limited offer (expires July 31st).

PORTFOLIO SYSTEMS

BBT2542 Dynodex Macintosh w/Free DynoPage Macintosh & DynoPaper	\$99.00
BBT2543 SmartScrap	\$55.00
BBT2442 DynoPaper (white, cream, gray, yellow) ...	\$14.00
BBT2826 Dynodex Macintosh Competitive Upgrade	\$49.00
<small>Macintosh Plus, SE series, II series, or Portable; System 6.0.3 or later.</small>	



REVIEWER'S NOTEBOOK: The Logitech series of advanced mice and scanners has won acclaim from the press — and thousands of loyal users. No other manufacturer engineers so much precision and innovation into their products. From an incredibly sharp hand scanner, to the all new breed of "programmable" mice, they're a pleasure to work with. We put the ScanMan 32 hand scanner through it's paces, performing over 50 scans of various black and white images — photos, line art, logos, type, illustrations — even poor-quality photos. The ScanMan 32 features 32 gray scale performance, with adjustable scanning resolutions from 100 dpi for quick scans; up to 400 dpi for magnificent finished images. Use scanned images in word processors, multi-media, desktop publishing, HyperCard, OCR and more.

The Science of Scanning Logitech technology destroys the old barriers of scanning, increasing the speed and accuracy of anything you scan. Superior image quality, with the ability to produce half-tones for reproduction. The set of output controls provide the best possible results on any printer or monitor screen. Its 4" wide scanning area allows full-page scans with just two quick passes.

And Logitech's rugged construction and precision roller system allows straight, unwavering scans. No curving, no skipping. The scanning speed indicator controls the movement for perfect scans every time. There are three settings for scanning photos and another for scanning line art. Its shape is perfect, its weight and components distributed equally for balance. All of which makes getting an image from paper — into your Mac, simple and easy.

The ScanMan 32 gives you a free set of software editing tools, including a 32 gray scale palette for detailed retouching. There's also a handy dimension box and tear off tool palette; use them alone or incorporate them as a desk accessory. Pop up real-time brightness and contrast controls, refine images with amazing flexibility, rotate, flop and invert images. Save your scans in a variety of formats, including MacPaint, TIFF and PICT.

Here's What You Get: The ScanMan 32 contains everything you need. The Model 32 Gray Scale scanner, SCSI interface box and cable, power supply adaptor, ScanMan software, version 2.0,

CatchWord Pro OCR software and complete user guide. Fast, easy — and powerful — the ScanMan 32 is a superior hand scanner.

Included with ScanMan 32 — CatchWord Pro: Powerful Optical Character Recognition (OCR) software that allows you to capture printed, hard-copy data by scanning it, rather than typing it. But, without quality software and a high quality scanner (like the ScanMan 32), scanning text won't work properly. "Dirty" scans produce unwanted characters and commands, requiring enormous cleanup — creating more work than rekeying.

CatchWord Pro delivers an amazing 99% accuracy in OCR testing, used in tandem with the ScanMan 32. CatchWord Pro is compatible with popular word processors, spreadsheets, databases and desktop publishers — so you can scan information directly into your application and use it immediately!

**TrackMan® — High Resolution Stationary Mouse.
\$10 MANUFACTURER MAIL-IN REBATE!**

TrackMan puts an input revolution on the Macintosh desktop. This award-winning design takes a trackball from a large center position and makes it smaller and more manageable by putting it under your thumb. It's easier to move around the screen, freeing your fingers to work the three large tactile buttons. Shaped so your hand rests on it easily, Trackman is more comfortable than any other trackball or stationary mouse.

**MouseMan™ — High Resolution Ergonomic Mouse..
\$10 MANUFACTURER MAIL-IN REBATE!**

MouseMan is more mouse than you've ever seen before for your Macintosh. Three programmable buttons offer you ultimate flexibility — program them for tasks you perform most and watch your productivity rise! MouseMan offers the high quality and excellent tracking on any surface that have built the reputation of all Logitech mice — constructed with the finest materials.

TIGER SPECIAL

**ScanMan 32 with
CatchWord Pro &
MouseMan MAC** **ONLY
\$389**

Only \$379 after \$10 manufacturer mail-in rebate.

LOGITECH

BBT2509 ScanMan 32 with CatchWord Pro	\$359.00
BBT5298 ScanMan 32 with CatchWord Pro and MouseMan MAC	\$389.00
BBT2220 ScanMan 32 with Digital Darkroom	\$289.00
BBT2200 MouseMan MAC	\$85.00
BBT2210 TrackMan MAC	\$79.00
<small>ScanMan 32: Macintosh Plus or better running System 6.0 or later. Hard disk recommended. TrackMan/MouseMan: Any ADB Macintosh running Macintosh, A/UX or X-Windows Operating Systems.</small>	

Rebate coupon included in box. Offer expires June 30, 1992.

Art of the Scan

A Personal Tutor For Mac Software!

Learn How To Use Excel, Word, PageMaker, 1-2-3 - And More!

REVIEWER'S NOTEBOOK: Puts a skilled — and very patient — expert at your side. Includes cassette tape and diskette, working together to talk you through the leading software titles. The interactive tutorials follow the tape — you can see the concepts come to life. It's an extremely effective method.

If you really want to USE your software's capabilities — now! These lessons are very nicely organized, completely hands-on and allow any pace. You'll be amazed at how quickly you can learn just about any program to the fullest because it's explained and demonstrated properly.

Pick A Program, Any Program. From Lotus, Claris, Microsoft, Aldus, Quark,



and HyperCard. Just slip in the tape — and 90 minutes later you'll be an expert on any software title. Learn everything you need to make work even easier, faster and more professional. Mastering sophisticated features is no problem, and more advanced training programs are available for experienced users.

Great office productivity resource, less costly than seminars or classes. Train your entire staff with the same tutorial; review material again and again... at no additional cost.

To date, over 400,000 tutorials have been sold and all come with a guarantee of satisfaction. We're confident you'll learn software better, faster and easier.

Some Titles are available in either Beginner, Intermediate or Advanced Versions.

Call Tiger for details...

PERSONAL TRAINING SYSTEMS

BBT2515 Mac Sys 7, Part 1 or 2	\$59.95
BBT2516 Mac Sys 7, New Users	\$59.95
BBT2517 MS Excel 3.0	\$59.95
BBT2518 MS Word 4.0 & 5.0	\$59.95
BBT2519 MS Works 2.0	\$59.95
BBT2520 Claris HyperCard 2.0	\$59.95
BBT2521 Adobe Illustrator 3.2	\$59.95
BBT2522 Lotus 1-2-3 for Mac 1.0	\$59.95
BBT2523 Aldus PageMaker 4.2	\$59.95
BBT2524 Aldus Persuasion 2.1	\$59.95
BBT2525 Aldus Freehand 3.1	\$59.95
BBT2526 Claris FileMaker Pro 1.0	\$59.95
BBT2527 ClarisWorks 1.0	\$59.95
BBT2528 Quark XPress 3.1	\$59.95

White-Knuckled, 3-D Combat Action Of The Future!

REVIEWER'S NOTEBOOK: The ultimate cyberpunk battleground — The CyberArena. The ultimate weapons and control systems. 3-D movement and the crashing sounds of a vicious attack! Spectre is the undisputed king of Mac entertainment technology and enables you to do multi-player battle with friends and associates via network. Strap yourself into your BattleCraft and take off into virtual reality. Robot crafts are moving in... their tactics are controlled by real-time artificial intelligence — you'll never anticipate their movement.

Macintosh game technology just got a new cutting edge. Spectre is the incredible battle theatre of the future, where you face the intelligent attacks of dozens of crafty enemy robot craft. You speed around the CyberArena, squeezing off deadly missiles, evading robot ambushes and counterstrikes in your quest to capture the enemy flag. Runtime artificial intelligence makes robots watch what you're doing and react to your every move, creating tactics based on your attacks. It is above and beyond any action challenge offered anywhere for the Mac or PC!

The LAN pack version of Spectre allows you and two other humans to battle each other! Slug it out in your customized BattleCraft vehicles. Glide smoothly, with blistering speed, across the futuristic landscape to trap and destroy the other players. Full multi-player



support over AppleTalk networks so single-users can blast each other to smithereens.

The artificial intelligence built into Spectre allows for an unlimited number of combat scenarios — the robot attack vehicles never never do the same thing! They plan tactics according to your moves and tendencies, so you've got to watch them carefully from the various views, zooms and inertial mapping that your craft's system provides. The color is incredible, the landscaped battlegrounds of the CyberArena are fascinating and provide the challenge of controlling your ship while you engage in blazing combat.

Do You Have The Guts? You begin by selecting your craft. You'll have an opportunity to tune it by distributing 15 points between speed, adding more armor, carrying extra ammo — whatever's best for your style of fighting. Adjust your Spectre hover engine's ability to glide over the surface of the CyberArena.

SPECTRE

BBT2540 Spectre	\$35.00
BBT2541 Spectre LAN Pack 3-User	\$59.00

The Informative, Intuitive Mapping Software.

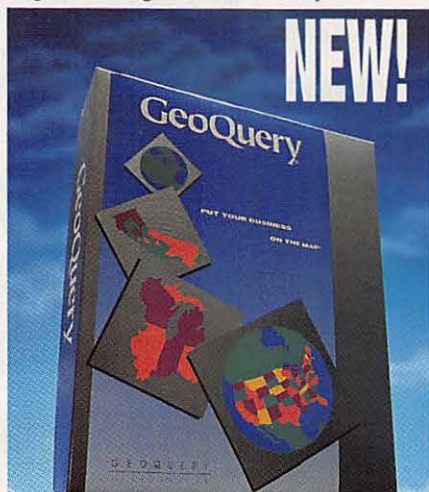
REVIEWER'S NOTEBOOK: How many years have you been looking at your business in rows and columns? And realizing that it just isn't laid out that way? Twenty minutes with GeoQuery will change all that. Providing you with a new, and much better view.

GeoQuery instantly transforms your customer and prospect lists — or any business data — into interactive maps. It lets you do things that are impossible with your spreadsheet, database, or contact manager. Things like making that extra sales call you would otherwise miss, choosing the best location for a seminar or service center, and assigning optimal sales territories. Making your presentations clear and compelling.

GeoQuery is the only software that lets you do these things quickly, easily and affordably. It's the perfect get-it-done tool for anyone whose business extends further than the eye can see...

GeoQuery's maps make it easy to spot the best places for growth. Otherwise miss, choosing the best location for a seminar or service center, and assigning optimal sales territories. Making your presentations clear and compelling.

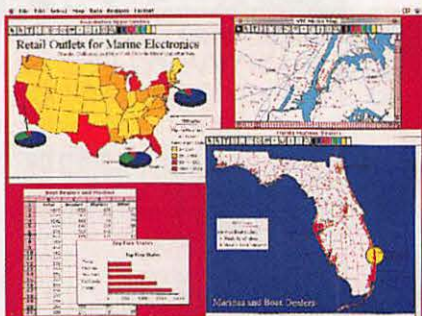
GeoQuery is the only software that lets you do these things quickly, easily and affordably. It's the perfect get-it-done tool for anyone whose business extends further than the eye can see...



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"Includes maps for US, Alaska and Hawaii with Interstate Highways and all 43,000+ ZIP code locations. High resolution maps with county boundaries are also included for the 11 largest metro areas."

Map Mountains Of Data. GeoQuery knows the location of every 5-digit ZIP code in the US — all 43,301 of them. So in the blink of an eye, your customer lists, prospects, corporate facilities, any ZIP-coded data, are magically pinpointed on GeoQuery's built-in maps.

But GeoQuery shows you a lot more than just your business sites. It lets you see how your data relates to each other. Sales territories to customers. Prospects to dealers. Service personnel to equipment installations. Not to mention the Interstate Highways, over a thousand cities, and extensive census data — all included in the basic package. You'll gain new insights on ways to service accounts better. Reduce travel time and costs. And spot the opportunities for growth that others are missing.

Know Where You're Going. How many times have you driven hundreds of miles, and made only one call? How many accounts did you drive past on the way? How would you know? Well, those days are over.

Team up GeoQuery with your contact manager or prospect database and a quick glance at the map will tell you who's next door. Or choose the Find Pins command and GeoQuery will instantly identify your closest account. You will make more calls in less time, sell more, and maybe get home a little earlier on Friday.

Sell Your Ideas. Maps are powerful tools to present and sell your ideas. Whether it's showing a client why you can service their accounts better, explaining that redistricting plan to the board of directors, or just reviewing sales results at the monthly meeting, GeoQuery's maps will help you present your results and sell your ideas. Quickly and effectively.

Free with purchase of GeoQuery:

DYNODEX

A perfect place to organize your names and addresses. A \$129 VALUE

GEOQUERY

BBT2106 GeoQuery	\$395.00
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Bone-Crushing Radius Rocket Speed!

**Scientifically Engineered
Performance For The Desktop Studio.**

REVIEWER'S NOTEBOOK: Radius has always been on the lips of art directors, designers and studio producers who use Macs. For years, the creative community has turned to Radius to speed their work and enhance their creativity. As an authorized Radius dealer, Tiger presents The Rockets: advanced Motorola 68040 processing power at a new lower price.

The revolutionary Radius Color Pivot Display is the only monitor that works the way you do — in both portrait and landscape modes. See a full page without scrolling. A spectacular value!

One other note: For PowerBook users who want a clean, crisp connection to external color displays, the Radius PowerView is the perfect instrument. Lightweight, small and built to survive an airport cargo crew, the PowerView displays up to 256 colors and easily plugs into your SCSI port.

Tiger is fully stocked with these magnificent new Radius products and ready to ship; but you must act fast, these are the most popular products in the business now. Your Mac will fly!

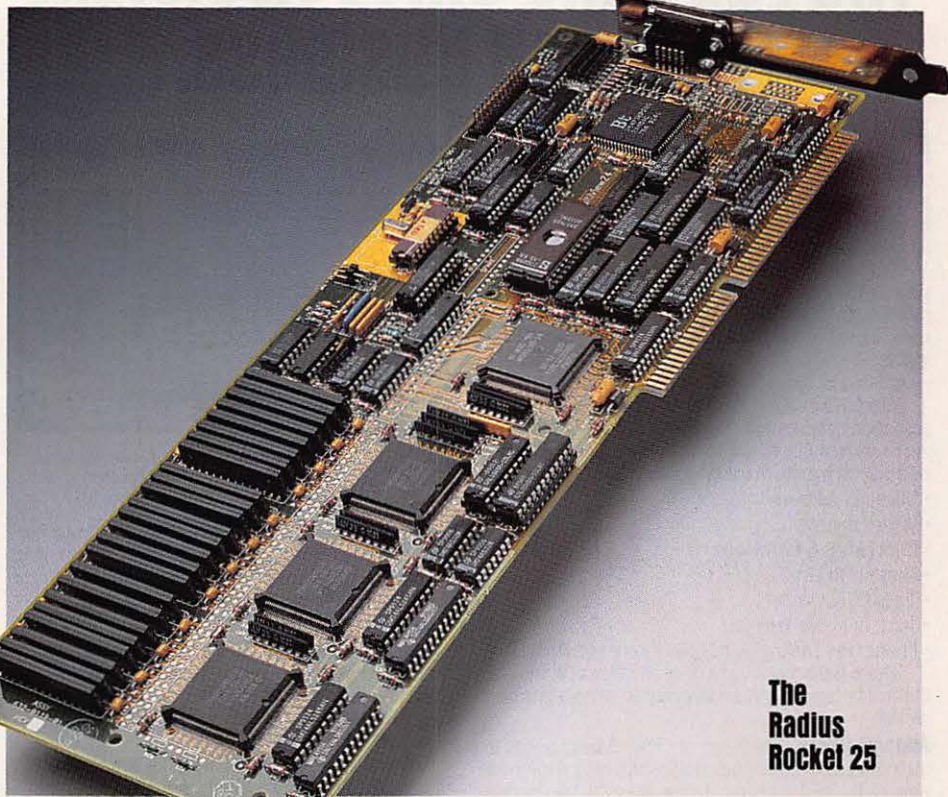
Accelerators. The Radius Rocket Accelerators provide lightning quick speed for Mac page layout and publishing applications. The Rocket 25 straps on 25MHz processing capabilities and includes a math co-processor. The Rocket 25i is a more affordable accelerator, but without a math co-processor. Then there's the Rocket 33 — featuring the fiery rage of Motorola's 33MHz 68040 processor. The Rocket 33 clocks in at over 32% faster than the 25MHz '040. (COMPARE VALUE!) The Rocket 33 is 30% faster than the Quadra 700 upgrade and is hundreds of dollars less! The Rocket 33 is the right board for 3-D modeling, like Pixar's MacRenderman, popular animation applications, publishing and image processing programs and more.

Radius Rocket 25. When the performance of a computer is increased, the productivity of its user is also increased. Since 1986, Radius has been boosting Macintosh performance; we continue that tradition today with a line of accelerators designed specifically for color publishing, graphic design, CAD/CAM, and general business applications.

The Radius Rocket 25 is an MC68040 CPU accelerator (same chip as used in the Quadras) which takes the Macintosh to performance levels previously unattainable. Its incredible design offers dramatic increases in productivity with the Macintosh II family of computers. Rocket 25 is perfect for intense computational and graphical applications like 24-bit color publishing, CAD, 3D rendering and scientific analysis. It is an excellent enhancement to network servers.

Rocket 25 increases Macintosh II performance up to 6 times. When configured with Radius display systems, Rocket 25 can power a Mac II up to 50 times faster when running certain applications. This affordable accelerator is fully compatible with existing software. Call us for complete details.

The Radius Rocket 25i. This is hot new Motorola '040 speed technology at an unbelievably low price. Built to dramatically speed up QuarkXPress, Adobe Illustrator and Microsoft Word. Growing 25MHz '040 processing performance for the Mac II, IIfx, IIfx and IIfx. At just \$1,395, the Rocket 25i is less than HALF THE PRICE of the Quadra 700 Upgrade (Apple charges you \$3,495 for it — ouch!). One of the industry's hottest boards at a great price. Full support of System 7,



**The
Radius
Rocket 25**

NuBus slot design for effortless installation. Great for speeding up RIPs! We were impressed with the software that is included with the Rockets. It allows your system to selectively enable or disable the '040 cache mode — actually making the Rocket more compatible with existing Macintosh software than the Quadras themselves!

Color Portrait And Landscape Display In One! The immortal Radius Color Pivot. The only monitor in the world that can display a full page in color and pivot to display a full page landscape too! Ask a pro how much easier that makes his life. Now your Mac can have this freedom, along with resolution up to 640 x 870. And the Color Pivot can provide full 256 color support (8-bit) on onboard video in the II Series, or full 24-bit color with Quadras — so you don't need an interface card.

The Color Pivot is perfect for design professionals and advanced desktop publishers, but it's also an ideal upgrade for everyday use, especially if you're "in and out" of a variety of applications. Just pivot to see as much of the screen as you need. And it is an excellent value. Consider this — the only other way to see a full page in actual size without scrolling would be to buy a 19" or larger display — many hundreds of dollars more than the Color Pivot!

Support For Virtually All Macintoshes And Built-in Video Too! Color Pivot satisfies virtually every customer requirement with support for:

- 16.7 million colors on the Quadra 700 or 900 Built-in Video
- 16 colors on both Mac IIs and IIfx Built-in Video, without an interface card
- 256 colors on the Mac LC, SE/30, IIfx and all NuBus Macintoshes with a Color Pivot Interface

So, if you need an 8-bit IIfx or IIfx color display solution, you can spend \$2298 on a landscape display system from Apple. Or for only \$1425, buy the Color Pivot, and get both a portrait and landscape display in one for about \$870 less. Only the Color Pivot comes

from the company that invented large screen display technology for the Macintosh. Radius.

NEW! PowerView Links PowerBooks To Large Color Displays! A must for PowerBook users on the run. PowerView is an external color display interface for 140 and 170 'Books. Just plug it into the PowerBook's SCSI and you're ready to go. Run the PowerBook's LCD as a second screen, or in presentation mode to see what your audience is seeing.

The Radius PowerView is a magic little box that connects the PowerBook to practically any color display. Ideal for the busy sales professional or executive on-the-go. When working in the home or office, PowerView users can work comfortably and productively with 256 colors. When on the road, users can use PowerView as an interface to large screen projectors, as well as to popular color displays, for delivering effective color presentations.

PowerView represents another technological breakthrough from Radius. Easily installed, PowerView plugs directly into the external SCSI (Small Computer Systems Interface) port found on the back of the Macintosh PowerBook and then connects to the display of choice. Currently PowerView supports the AppleColor 13" RGB Display, the Radius Full Page Display, and VGA-compatible and multi-frequency displays. Future software releases will enable support for the Radius Color Pivot and Pivot Displays.

Tiger Carries The Complete Line Of Radius Products. Call For Details.

RADIUS

BBT2780	Rocket 25 Accelerator	\$1395.00
BBT2781	Rocket 25i Accelerator	\$1859.00
BBT2782	Rocket 33 Accelerator	\$2299.00
BBT2783	PowerView Interface	\$535.00
BBT2784A	ColorPivot Monitor LE	\$1425.00
BBT2784B	ColorPivot SE/30 Interface	\$549.00
BBT2784C	ColorPivot II Interface	\$549.00
BBT2784D	ColorPivot IIfx Interface	\$549.00
BBT2784E	ColorPivot LC Interface	\$549.00

The Full-Time Office Assistant For Small Business.

In this day and age of over-complicated software and highly technical jargon, it's a welcome relief to see something you can really use! And that's what we love best about Office Manager — it does exactly what needs to be done in any small office. Efficiently. Smartly. Quickly.

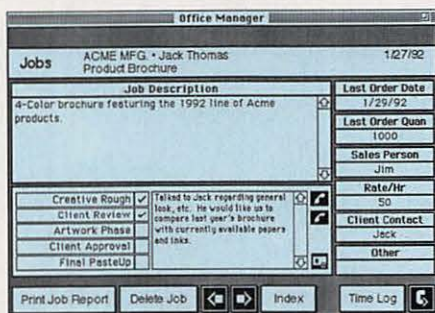
Right out of the box in just a few hours, everyone in your office will be using Office Manager — getting more done in less time. Business letters that used to take 20 minutes are done in a flash! A few mouse clicks is all it takes to print standard business correspondence — and that includes the envelope.

Office Manager is the perfect complement to any accounting application. Together they do 99% of what every small office needs to do. Office Manager is the best way to handle these everyday tasks:

- Maintain Addresses
- Write Letters
- Print Labels & Envelopes
- Keep To-Do Lists
- Track Client Jobs
- Track In-house Projects
- Phone/Fax Dialing (with Call History and Redial)

These tasks make up 90% of all office activity. The Office Manager is a vital necessity in today's business world.

Address Cards. The heart of Office Manager lies in the Address File. From this central hub of vital information, all the various parts of your office fall into perfect place. More than just name, address and phone num-



Track client jobs quickly and easily. User-defined title fields make Office Manager fit your type of business. You'll know in an instant the exact status of any job.

automatic features), then instantly jump to your current word processor. Use it to check spelling, grammar, etc., then automatically jump back to Office Manager to print the letter and log it in the History log. You get the best of both worlds!

Merge Letters. We fell in love with this feature the moment we saw it — easy, instant, customized form letters. What a time saver! If you spend time writing repetitive letters on the same subject, you'll love this feature as much as we do.

Predefined letters like "Thanks for Your Business", "Special of the Month", "Welcome New Customer", or anything you can think of will be instantly printed with just a few mouse clicks. It's the easiest way we've ever seen!

Need to send the same custom form letter to a group of people — in a hurry? No problem. A few easy clicks and you're done. Limit your targeted group using zip codes, special categories and keywords that are assigned to address records, or a host of other possibilities. Getting the right letter to the right group of people has never been easier. It's amazing how easy this do-it-all application really is.

Fax & Phone Dialer. How much time do you spend each day, first finding the right phone number, dialing the phone or fax machine, then possibly re-dialing because of busy or wrong numbers? I added it up one day — I spent an average of 45 seconds for each phone call, and over 75 seconds for each fax. That adds up to a lot of time each week!

With Office Manager, time is money in my pocket — my numbers are automatically organized, and I have a complete history of every call. I keep more numbers, right at my fingertips.

Let's talk automation. Office Manager walks me through every call, giving me capabilities I never dreamed of before. First I smoothly find the right Address Card (in all of two mouse clicks and the first letter or two of the person's name). Then I click on one of the three dialer buttons (two for phone and one for fax). My Mac beeps out the number, logs the date and time of the call in the History Log, then immediately gives me three possible options: No Answer, Left Message, or Call Later.

Office Manager covers every possibility. If my call is answered, I can enter notes for future reference. If there's No Answer, the automatic History entry for this call is erased. If I Leave a Message, it says so in the History log. Or I can choose to Call Later, in which case Office Manager puts a note in my To-Do List. Now that's automation!

Redialing is an automatic, one-click operation —

from anywhere in Office Manager. You don't have to find the original Address Card again. Any last number is redialed, then the correct Address Card is instantly displayed again with the call options ready.

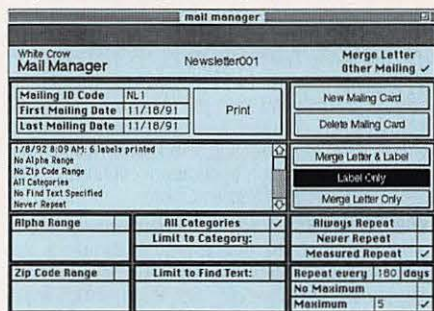
Office Manager's dialing features will work with any standard phone. (Hold a telephone receiver up to the speaker while it beeps and your number will be dialed.) But for fully automatic operation, you should get HyperDialer. It's less expensive than a modem and works great on multi-line office phones too. Ask one of our TigerReps for more information.

Fax Cover Sheet. Another result of the exceedingly smart design that went into Office Manager is the one-click Fax Cover Sheet. With the optional comments, printing an entire fax has never been easier. Slip the printed page into your fax machine, press the Office Manager Fax Dial button and presto! You're done and ready to move on.

Job Tracking. This potent Job Tracking feature for your clients could be a separate application all by itself. This one's a real powerhouse! Track every phase and part of a job. Every time one of your clients calls, you instantly start tracking a new job. Jot down quick notes for reference. Run the automatic Timer in the background to track your valuable time. Print a Job Report including total time for the job for fast billing purposes.

In-House Projects. There's always a project running around the office that needs your attention. Whether it's what supplies need to be ordered, new topics that need to be covered in the weekly meeting, or ideas for the upcoming company newsletter, you need something to keep track of it all.

Mail Manager. This optional add-on to Office Manager is a must for anyone doing bulk mailing. You get advanced sorting power, elaborate search filters and powerful mail-merge options. The smooth integration and seamless operation between Office Manager and Mail Manager make these two fit hand-in-glove. Each uses the already established features of the other to complement and expand all operations.



The optional Mail Manager add-on is vital for bulk mailings. Save time and money by eliminating duplicates and targeting only the addresses you want.

ber — Office Manager is a fully automatic organizer. It's packed with computerized features and abilities that save you time and money right from the first moment. But the #1 advantage of Office Manager is the common-sense, logical way everything works. You'll instinctively know what to do next. And what you do will get twice as much done in half the time.

Letters.

Business Letters. With Office manager's built-in word processor, you'll whip out business correspondence in record time. Office Manager pays for itself in saved time within the first month. Start with any Address Card, then one quick-click starts a letter — complete with name, address, heading, date and greeting. All you do is fill in the body — then click to print it.

Another single, quick click and you just printed the address on the envelope. If you have the new LabelWriter from CoStar (available in this issue of Tiger), there's even a special button that automatically prints the label for your envelope. This is seriously fast correspondence!

But not only fast — smartly organized. Every letter, every phone call, every fax is automatically logged in the Telephone & Mailing History file. I have a full history for future reference, complete with date, time and optional notes.

But what about the word processor you already use? Office Manager lets you start a letter (with all it's

With Mail Manager, you save time, materials and postage by eliminating duplicate mailings to the same person. By choosing "Search for Duplicate names" right from the menu, Mail Manager will weed out duplicate entries in your Office Manager address file.

Office Manager Remote. Without investing in an expensive network, Office Manager Remote allows you to enter names and addresses on any remote Mac and later merge the information into Office Manager's main file. With a simple floppy disk update, your new addresses will make it onto every Mac in your office. Only new or changed addresses get copied. You get network benefits without the expense. Office Manager Remote requires Office Manager. A separate copy of Office Manager Remote should be purchased for each additional Mac.

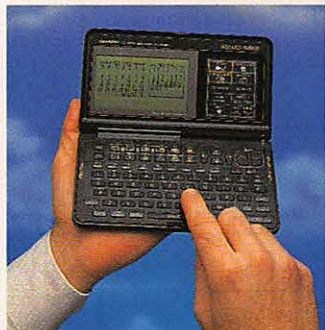
WHITE CROW

BBT2030 Office Manager	\$89.95
BBT2031 Office Manager And Mail Manager	\$139.95
BBT2032 Office Manager Remote	\$75.95
Requirements: Mac Plus or higher with at least 2 meg of RAM and a hard disk drive. Mac system software 6.0.5 or later. Office Manager is system 7 compatible. Each package includes HyperCard 2.1.	

THE SHARP WIZARD vs. MAC POWERBOOK

Pick up any Macintosh magazine and you'll see pages and pages of advertisements and reviews on PowerBook computers. They sport all kinds of bells and whistles, come with tons of software and promise all the functionality of a desktop Macintosh. And that's great.

But if you talk to people who actually buy and use PowerBooks, they'll tell you that while their PowerBook is extremely cool, it's more computer than they really need when they hit the road. Using a PowerBook to retrieve phone/FAX numbers, price lists, appointments, to do lists, birthdays and flight arrangements is overkill. What you really need is a Sharp Wizard 8000 (or its bigger brother, the 8200, pictured below). Small, compact, without the inconveniences of



battery recharging. The Wizard 8000 has everything road warriors need: scheduler, word processor, spreadsheet, city guide — even games! Its built-in applications are extremely easy

to learn and use. And it fits in your pocket! PowerBook users are turning to Wizard for INSTANT retrieval of names and numbers. The PowerBook can't do that...

Designed to Do What Your PowerBook Can't. The Wizards from Sharp are sophisticated, powerful computers designed specifically to organize all of your per-

sonal information. Whether you're jotting down names, numbers and expenses or creating 3-D charts and downloading spreadsheets. Its power has been allocated to fast, easy collection, storage and retrieval of anything. The Sharp Wizard delivers the ultimate in portability.

The Wizard focuses on the fundamentals. Like an extra wide, super-crisp screen which allows an impressive 40 character by 8 line view. The display is the single most important feature in any small computer, and nothing I've seen compares to The Wizard. I love the way each key is exactly where you'd expect it to be. Search with one stroke, perform any task by just touching an icon. The Wizard's keyboard is tight and responsive; the keys are crafted from superior materials.

Organizer Accessories. There's an optional modem, printer, fax and a slew of software cards that turn the Wizard into a fully functioning office, so you can conduct business anywhere. With the Link cable, you can download information from your Macintosh to your Wizard and have up-to-the-second information when you take it on the road.

Expand The Sharp's Mind... When you add software and memory cards to your Wizard, you put all kinds of possibilities at your fingertips. Memory and applications simply slide under the touch-sensitive screen which acts as a keypad to perform tasks, open applications — and more.

Time Expense Manager. The powerful way to manage and prioritize your schedule, track your expenses and deadlines, and account for all the time spent on projects or meetings. Your secretary on the road!

Spreadsheet. Create fully functional, Lotus 1-2-3 file compatible, 26-column-by-999-row spreadsheets on your Wizard, or download a spreadsheet from your Macintosh! This card will hold 64K of data! Built-in features include:

10 templates, complete formatting, sorting and "freezing pane" functions, math and financial calculations, spreadsheet-linking capabilities, cut & paste and more.

SHARP WIZARD

BBT6310 ZO-5200 Sharp Wizard	\$199.95
BBT6311 OZ-7200 Sharp Wizard	\$239.99
BBT6312 OZ-8000 Sharp Wizard	\$299.99
BBT6309 OZ-8200 Sharp Wizard 128KB	\$399.99
BBT6313 Organizer Modem	\$179.99
BBT6314 Organizer Talk (OZ-7000 series only)	\$99.99
BBT6315 Organizer Fax/Modem	\$499.99
BBT6320 Time Expense Manager	\$119.99
BBT6321 Dictionary/Thesaurus	\$129.99
BBT6322 8 Language Translator	\$99.99
BBT6323 Money Planner	\$99.99
BBT6324 Spreadsheet II	\$179.99
BBT6325 Scientific Computer Card (7000 series)	\$109.99
BBT6317 Scientific Computer Card II	\$109.99
BBT6326 North American City Guide	\$79.99
BBT6330 Box Jockey	\$49.99
BBT6331 Organizer Chess	\$109.99
BBT6332 Tetris Game (7000 series only)	\$49.95
BBT6318 Hatris Game (8000 series only)	\$49.95
BBT6319 Backgammon Game (7000/8000 series)	\$49.95
BBT6333 Organizer Bible	\$149.99
BBT6340 Portfolio Card	\$129.99
BBT6341 32K RAM Card	\$79.99
BBT6342 64K RAM Card	\$129.99
BBT6345 128K RAM Card (7200/8000/8200)	\$149.99
BBT6346 Mac Organizer Link	\$109.99
BBT6347 IBM Organizer Link II	\$129.99
BBT6350 Leather Case (OZ-7000 series) (Reg. \$34.99)	FREE w/OZ-7200
BBT6351 Leather Case (OZ-8000 series) (Reg. \$34.99)	FREE w/OZ-8000 or 8200
BBT6399 Video Guide (Reg. \$34.99)	CALL!
BBT6352 Battery Pack (for OZ-8000 series)	\$34.99
BBT6353 Printer	\$169.99
BBT6354 Dubbing Cable	\$29.99

Print A Label In Less Than 4 Seconds!

LabelWriter II Provides Professional Print Quality (For Type AND Graphics).

REVIEWER'S NOTEBOOK: Brand new, just released, The LabelWriter II is more powerful, faster and easier to use than the smash hit original LabelWriter. LabelWriter II is five times faster than the original, with higher resolution and larger label capacity. Razor-sharp images, crisp type and whisper-quiet printing. You'll be amazed at how great this little spitfire prints! The quality is as good as our expensive desktop lasers! Weighing in at just one pound, just set it beside your rolodex and print labels all day! This product defines the word "convenient!" Just plug in the LabelWriter II power cord and cable, pop in the diskette and you're ready to print. Need a single label for an envelope, file folder or floppy disk? Knock it out — faster than writing it by hand! Need hundreds for a mailing list, or for barcoding inventory? Knock them out in record time.

Also Available — AddressWriter.

This neat little printer will shoot out a beautifully printed envelope, postcard, or label, complete with postal bar code, in seconds. Its straight paper path assures that envelopes feed without curling or jamming.

Just pop up the LabelWriter II software over any application and print anything from within that application — or anywhere else.



Labels On Demand!

One of the most valuable capabilities you can give to your Mac. The LabelWriter II includes powerful software that enables you to quickly set up label templates, create specialized database listings, mix text and graphics on a single label and more!

LABELWRITER II

BBT6004 LabelWriter II — Macintosh	\$195.95
BBT6008 LabelWriter II Plus — Macintosh	\$299.95
BBT6009A LabelWriter II AppleTalk Network Interface	\$159.95
BBT2008 AddressWriter	\$469.95
BBT2544 LabelWriter Labels	\$48.50

Track Document Changes Instantly, Accurately and Painlessly!

REVIEWER'S NOTEBOOK: A tremendous time-saver for technical writers, lawyers, engineers, contract administrators and other professionals who spend tedious hours reviewing or marking document changes. DocuComp automates version control with a patented technology that finds changes fast and displays them to you in a variety of important ways. Awarded a rare 4-and-a-half mice from MacUser Magazine...

DocuComp is 100% thorough in its comparisons — change one comma and it is detected and reported. But version control is more than that. It's a system to prevent costly oversights and elimination the margin for error in documents containing highly technical specifications. It's the only product of its kind for the Macintosh.

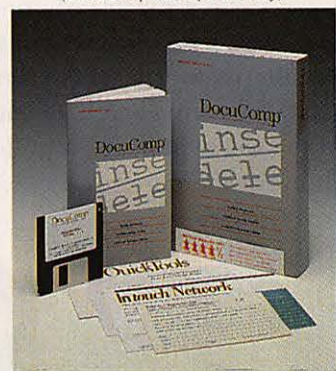
How Does It Work? DocuComp's ingenious pattern recognition capabilities support most popular word processors, and includes an option for comparing computer source code. This technology is the most advanced for accurately tracking inserted, deleted, replaced and moved text. And if you work with SGML (Standard Generalized Markup Language), DocuComp will let you define custom SGML tags for marking document changes.

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ferent word processors.

So you've compared two versions of the document. Now, conveniently report or save the results of a comparison by having DocuComp create a new, composite document — known as a "redlined" version. Choose from a variety of easy-to-see formats to highlight the changes. Many ways to work changes or omit previous versions.

Buy DocuComp and get RightWriter Free! Free Upgrade for DocuComp 1.5 Buyers. (DocuComp 2.0 ships late May)

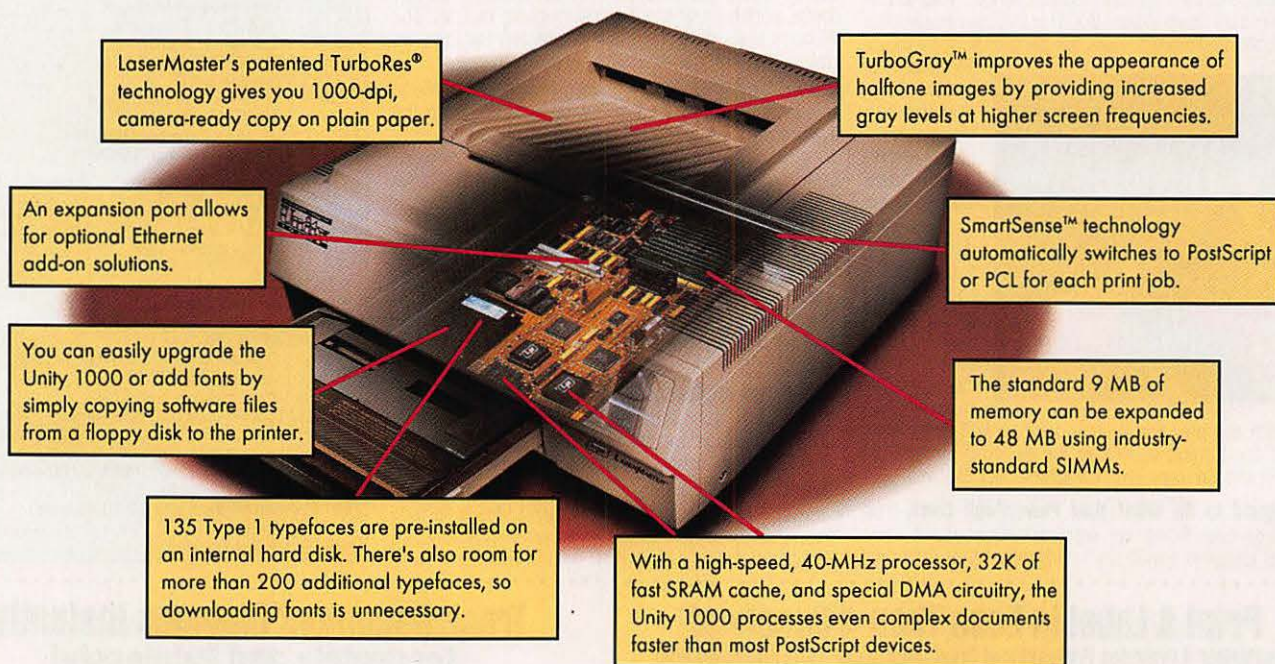


DOCUCOMP

BBT2010A DocuComp Version 1.5	\$99.95
BBT2010B DocuComp Version 2.0	\$119.95



If only you could design your own typesetter...



You'd make it fast. You'd have it print camera-ready copy on plain paper. You'd design it to store so many typefaces that you'd never waste time downloading another font. You'd make it easy to expand and upgrade, so it wouldn't become obsolete. And you'd make it capable of printing from just about any computer out there, just in case you ever need to print camera-ready copy from another computer. While you're at it, you'd probably throw in a hundred free typefaces.

Sounds just like our new Unity 1000 Plain-Paper Typesetter. It's fast. It prints at 1000 dpi. It's expandable and software upgradable. It handles fonts like no other printer can. And, it comes with 135 Type 1 typefaces—that's 100 more than other PostScript devices.

Combine these great features with multi-platform capabilities, and you have the kind of typesetter you've been waiting for. Unity provides simultaneous connectivity to virtually all operating environments, so if your office happens to use PCs as well as Macs, you're in luck. Unity's HotPorts feature

automatically selects the LocalTalk, parallel, serial, or optional EtherTalk interface, and SmartSense automatically switches to PostScript or PCL.



Give us a call to find out more about the Unity 1000. We bet it's the typesetter you've been waiting for.

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Circle 182 on reader service card

MACWORLD

THIS MONTH:

Microsoft Works 3.0

• Color-Matching
Standard • HP's
ScanJet IIp • Apple,
Sharp Agree to
Make Organizer

NEWS

BY DAN LITTMAN AND TOM MORAN



Apple's System-Level Security

Apple Computer plans to incorporate security technology developed by RSA into Open Collaboration Environment (OCE), the soon-to-be system-level E-mail engine.

Each RSA user has a public and a private key, or code. To sign a digital file, the sender uses the private key, which the recipient can verify with the sender's public key; in order to send a secure message, the sender encrypts it with the recipient's public key, which only the recipient's private key can decrypt.

To provide security when creating the keys, RSA has a secure device that requires several physical keys, each with a magnetic strip containing the authorized user's digital key, to operate. RSA will also provide key-creation services for small companies. No price was set at press time. RSA, 415/595-8782.—D.L.

Apple's Latest CD ROM Drive

APPLE HAS introduced the AppleCD 150, a CD ROM drive that costs about 25 percent less than the previous Apple offering and is much smaller. The new drive works with all Macs from the Plus up, and is compatible with System 7 and QuickTime. It has a 380ms average access time and a 64K buffer. Users can plug headphones into the drive.

The AppleCD 150 is shipping now at a suggested list price of \$599. The existing AppleCD SC Plus has been replaced



THE APPLECD 150 IS A LESS-EXPENSIVE AND SMALLER CD ROM DRIVE FROM APPLE.

by the new drive. Apple is including the Apple CD-ROM Titles Sampler disc, which contains a listing of Macintosh CD ROM titles and some demonstration versions. Apple will also include several third-party sampler discs for a limited time. For more information, contact your local Apple dealer.—T.M.

Connecting LocalTalk Printers to Ethernet

Sonic Systems' LaserBridge is Mac software that allows LocalTalk printers to tie into Ethernet networks without a router. The LaserBridge INIT is compatible with System 7. The software requires Ethernet Phase 2, but it will work with all Mac Ethernet boards. It supports Apple's LaserWriters, the ImageWriter LQ, the GCC BLP II, and HP's DeskWriter and DeskWriter C, among others. LaserBridge is shipping at a list price of \$199. Sonic Systems, 408/736-1900.—T.M.

Apple Offers Printer and Scanner for Windows

IN A MAJOR SHIFT of strategy, Apple Computer has introduced a scanner and printer designed to work with DOS PC systems running Microsoft's Windows operating environment. The move allows Apple to gain economies of scale by selling into a new market that includes roughly 30 million installed systems, but it may also cause some confusion as to Apple's commitment to its own knitting.

The new devices are the Apple Personal LaserWriter NTR, a 4-ppm laser printer with a high-speed RISC processor, and the Apple OneScanner for Windows, a version of the company's existing OneScanner for Macintoshes. The \$2199 PostScript Level 2 printer works with Windows machines and Macs, alone or in mixed environments. It includes HP's PCL 4+ page-description language for Windows machines.

The Apple OneScanner for Windows is essentially the same as the current, extremely popular OneScanner, but it comes with a Windows version of the Ofoto scanning software from Light Source. The other main difference is that it ships with a SCSI board that fits inside the Windows PC. Apple will charge \$1299 for the OneScanner for Windows, the same price as the Mac version, despite the fact that it includes the extra SCSI board.—T.M.



THE APPLE ONESCANNER FOR WINDOWS IS ONE OF APPLE'S FIRST PRODUCTS FOR IBM-COMPATIBLE SYSTEMS.

The new Bernoulli 90. Consider it a hard disk you'll never outgrow.

Introducing the PRO series.



My, how your data has grown. System 7 and QuickTime have added a lot. To get more storage, you could buy a bigger hard disk, but that's like getting another bowl for this fish.

Why do it? When for practically the same price and performance, your data can swim in the open sea, so to speak, of the new Bernoulli® 90 PRO from Iomega®.

The best removable solution.

Because the Bernoulli 90 PRO is removable, it never fills up. You simply insert another affordable 90MB disk—180MB with included compression.



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Use Bernoulli Disks for primary storage. Take

them with you. Back up onto them. Lock them up. You get total data control. A new 18-msec effective access time is as fast as most any hard disk.

Plus, Bernoulli's universal design means your drive will grow with you whether you change systems or platforms.

The most recommended drive.
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Unfortunately, this ad isn't a Bernoulli. We've run out of space. So call today for a free brochure about the new PRO series drives. They offer the price and performance of a hard disk. But never fill up. And that's no fish story.

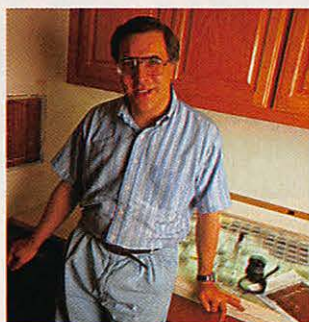
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Apple and Sharp to Make Personal Digital Assistant

In a major alliance of industry heavyweights, Apple Computer and Sharp Corporation have agreed to codevelop a Personal Digital Assistant (PDA) based on new Apple software and Sharp's hardware. Sharp, a leading manufacturer of LCDs and maker of the Wizard organizer, is expected to provide the screen for the hand-held electronic information device. The PDA will be an entirely new product category for Apple.

The two companies have formed separate product teams to work on the project, which is not expected to come to fruition until the beginning of 1993 at the earliest. The name, expected price, and other features were not described in the announcement.—T.M.



JENNIFER CHEUNG

DR. BRUCE ZUCKERMAN WITH A TRANSPARENCY OF A LARGE SCROLL FRAGMENT (TAPED TO WALL) AND MANY TINY FRAGMENTS.

Saving the Scrolls

The Dead Sea Scrolls are deteriorating, and the race is on to thoroughly record their meanings and material condition before time runs out. To complicate the problem, many of the photos of the scrolls taken during the 1950s are now deteriorating as well, so the negatives of those photos must be duplicated. Dr. Bruce Zuckerman and a team of scholars from the Ancient Biblical Manuscript Center in Claremont, Califor-

HP Unveils ScanJet IIp

INTENDED FOR low-cost scanning of text and images, the HP ScanJet IIp scanner from Hewlett-Packard offers 256 levels of gray and lists for \$1395. The flatbed scanner has a native resolution of 300 dpi, but can be enhanced through hardware and software to an effective resolution of 600 dpi.

The HP ScanJet IIp comes with a version of Caere's OmniPage Direct OCR software that provides free scans and interpretations of 25 text documents. After the 25 scans, the user can call Caere at 800/395-5823, give a credit card number, and purchase the password that makes the OCR software fully operational. Caere is offering a special price of \$300 for OmniPage Direct with the ScanJet IIp. HP's AccuPage technology, which enhances the accuracy of text recognition and formatting, is included with the scanner.

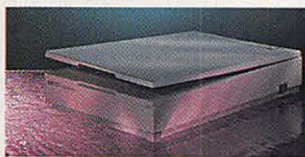
HP has begun shipping the ScanJet IIp, which also comes with HP DeskScan IIp, software that automates installation and scanning. OmniPage Direct for the Macintosh is expected to ship in June. HP, 800/752-0900.—T.M.

nia, devote much of their energy to this effort, and Apple has given them a Quadra to help. Zuckerman hopes to replace the tricks he now performs in the darkroom with image processing, employing the Quadra in digital restoration, realignment of fragments, and uniform lighting of curved surfaces. He will also use it to archive thousands of photographs, old and new. Ancient Biblical Manuscript Center, 714/621-6451.—ANN GARRISON

Apple Plan Recycles Toner Cartridges

To reduce the enormous waste of throwing away toner cartridges, Apple has begun a recycling program for cartridges from all of its laser printers. New Apple toner cartridges will include a description of the program and a prepaid mailing label for the old cartridge. Users put the old cartridge in the box the new cartridge came in, slap on the mailing label, and drop the box in the mail.

Apple said for every cartridge received it will contribute \$1 to be divided between The Nature Conservancy and the National Wildlife Federation. You can also obtain a prepaid mailing label by calling Apple at 800/776-2333.—T.M.



TOM GIBSON

THE HP SCANJET IIP SCANS UP TO 256 SHADES OF GRAY AT RESOLUTIONS UP TO 600 DPI.

News



IN WORKS 3'S DRAW MODE, TEXT CAN BE LAID OUT IN LINKED COLUMNS AND EMBELLISHED WITH DRAW TOOLS.

The Return of Works

INNOVATIVE NEWCOMERS like BeagleWorks and ClarisWorks have broken Microsoft's monopoly on integrated software, forcing the giant to upgrade Microsoft Works to version 3.0.

The new Works 3.0 is already outdated. In particular, its modules have no hot links between them, unlike the Claris and Beagle Bros products. Works also lacks paint tools. But within those constraints, it is packed with useful new features, its modules share a consistent interface, and all tools are avail-

able wherever appropriate—for example, the draw tools show up everywhere (except in the communications module). Draw is also a separate module that, with linked text columns, does double duty as a desktop publishing module.

Strong new features include Word-like rulers and footnotes and a drop-down guide for aligning text in the word processor; high-low charts; multiple user-definable database layouts (with envelope and label layouts provided); many date and time formats in the spreadsheets; and a macro recorder for communications.

Works lists for \$249. Microsoft, 206/882-8080. —D.L.



TURKEY SHOOT

DESIGN FLAWS NOTED

CheckFree If they deliver your mortgage payment late, guess who pays the late fee. Hint: Not CheckFree.

MicroPhone II 4.0 Shrink-wrapped vaporware? The Loran application bundled with MicroPhone has gorgeous buttons for navigating CompuServe and other online systems. Someday those buttons will work.

AppleShare 3.0 Feeling secure? Then you didn't notice the normal Mac desktop on the server volume—where anyone can access your files, even if they're password-protected on the network.

Macworld will send you a Turkey Shoot T-shirt if we shoot your turkey in this column. See *How to Contact Macworld*.



If there were a printer that could give you this kind of color, would you still make your presentations in black and white?

Do your business presentations go in one eye and out the other? The Colormate™ PS can easily and affordably give them the impact they deserve. Enhancing your work with truly amazing color, from brilliant primaries to soft pastels. All Pantone® approved.

The Colormate PS integrates readily with any network, PC or Mac. And it's compatible with most popular business presentation and graphics software. Of course, Adobe® PostScript® is standard. The Colormate PS comes in two

models—the economical Model 40 with 4MB of memory and 17 resident fonts, and the fully featured Model 80 with 8MB of memory and 35 resident fonts. Both feature reliable 300 DPI thermal transfer technology.

For your free Color Presentations Guide and more information, call 1-800-NEC-INFO. Or call NEC FastFacts, 1-800-366-0476, document #26567, for info via fax.

After all, the world isn't black and white, why should your presentations be?


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C&C Computers and Communications

Circle 180 on reader service card

NEC

**IN 1980,
WE
INVENTED
A NEW
WAY TO
SAVE YOUR
FILES.**

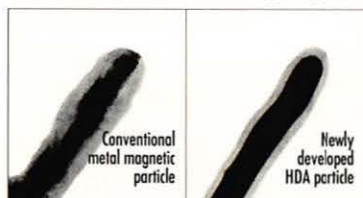


BUSINESS.



KEEP YOUR BUSINESS MOVING FORWARD BY BACKING UP.

While the information revolution brought great advances, it also brought great anxiety.



These improved magnetic particles can actually help hold your business together.

Like knowing your company could be exposed to a loss from which it may never recover.

The loss of vital information, the lifeblood of your business.

Because in today's computerized office, valuable files that you've created over the years can be lost in mere seconds.

All it takes is a slip on the delete key. A sudden power failure. A quick-spreading virus. Or, the ultimate disaster — hard disk failure.

Every bit and byte of information your business runs on can be suddenly wiped out. Critical data that can cost thousands of dollars and hundreds of hours to replace.

If it can be replaced at all.

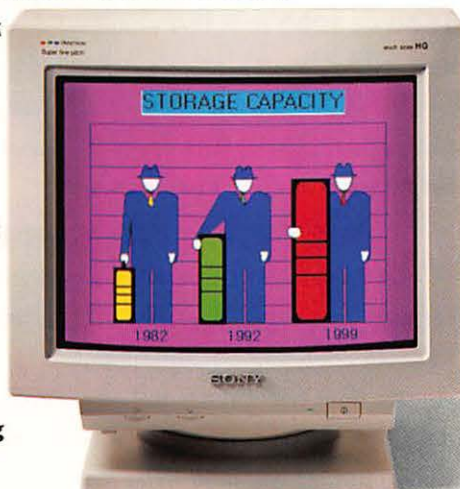
To counter all your new found worries, Sony has a number of reassuring options for you.

Read on, or risk having your business left behind.

A SAVINGS PLAN FOR PRICELESS DATA.

It all began back in 1980 when we introduced the 3.5 inch floppy disk.

For the first time, hundreds of cumbersome pages could be preserved on one space-saving disk.



A disk that quickly became the industry standard.

Today, we're evolving equally innovative data storage products to help your business grow.

We took a long, hard look at what computer users need today. At personal computer users, workstation users and LAN users. And at what businesses are likely to need way into the future.

Then we created a whole new generation of data

media. From more versatile floppy disks and higher-capacity data cartridges to faster-access rewritable optical disks. All designed to provide the most efficient data storage and retrieval for businesses of all sizes.

FLOPPY DISKS FOR TODAY'S MOVERS AND SHAKERS.

Twelve years after inventing the 3.5 inch floppy disk, we're still further perfecting it.

Our new XT series of floppy disks is designed for the way people use computers today. And where they use them.



These new disks have a smoother surface which drastically reduces friction between the disk and the drive.

The result is the fewest read and write errors ever. And because 20% less power is needed to run the drive, they easily cope with the harsh demands of portable and laptop computing.

The 2 megabyte XT floppy has a new, reinforced layer to protect your data from scratches and dust. Making these disks ideal for businesses on the go.

INVEST IN PRECIOUS METALS.

In business, nothing is more precious than data preservation. Except, perhaps, self-preservation.

Fortunately, over 30 years ago, Sony discovered the benefits of metal tape technology for high-density recording.

Today, you can see the rewards of our efforts in our 8mm and 4mm data cartridges. Highly advanced metal tape technology that provides even longer-term stability.

8MM DATA CARTRIDGES. DESIGNED TO SAVE YOUR DATA, NOT YOUR BIRTHDAYS.

We weren't satisfied to just invent the 8mm video recording format.

So to meet the need for improved data integrity, we developed an enhanced data



A 5 gigabyte 8mm data cartridge can store a stack of papers 30 stories high, leaving more room for your business to grow.

grade 8mm cartridge for quick, safe, reliable backup.

Our enhanced data grade D8 holds a staggering 5 gigabytes of information (roughly equal to 7,000 standard floppy disks).

You'll find safety features never conceived for video grade 8mm tape, offering drastically

improved durability. And a shelf life in excess of 30 years under recommended conditions.

For today's most demanding data storage and backup applications, Sony D8 cartridges are designed to give



your business a memory worth celebrating.

DDS 4MM DATA CARTRIDGES. ADVANCED BACKUP IN A COMPACT FORMAT.

The 4mm DDS data cartridges use Sony's advanced DAT technology.

Not to make music, but to store the data that keeps your business humming.

This highly advanced format was developed along with Hewlett Packard.

It results in an incredibly compact DDS cartridge that can handle up to 2 gigabytes of data, while providing maximum security for all your vital storage and archival needs for years to come.

Somehow, we thought you'd like the sound of that.

1/4 INCH BACKUP FOR A SAFER WORKPLACE.

Sony QD series data cartridges are designed to keep your data protected from any potential accidents.

The versatile 1/4 inch cartridges come in a variety of standards and offer superior error-free recording and easy to use convenience across a wide range of applications.



Thanks to our ongoing improvements, tape drop-out has been greatly reduced, while tape speed fluctuations are a thing of the past.

There's even the new QD 9135 data cartridge with a 1.35 gigabyte capacity. Giving data-dependent businesses all the room they need to grow.

REWITABLE OPTICAL DISKS HELP YOUR VISION EVOLVE IN A WHOLE NEW WAY.

As the leader in optical technology, only Sony

designs and manufactures both 5.25 inch and 3.5 inch rewritable optical media and drives.

So it stands to reason we understand the technology better than anyone else. Our 5.25 inch rewritable optical disks can sustain 10 million erase/read/write cycles,



Our 5.25" rewritable optical disk is breaking all jukebox records.

ensuring long-term data integrity. While in an optical jukebox, these highly durable disks can cope with countless loads and unloads.

And by offering the first 30 year warranty, Sony continues to write new standards for optical media.

We've also put a new spin on 3.5 inch rewritable optical media with disks that perform equally well in all 1800 — 3600 rpm ISO standard drives. Providing a new level in media interchangeability.

Durability, direct accessibility and portability make Sony rewritable optical disks the ideal storage media for forward-looking businesses.



WE LEAD, THEY FOLLOW.

At Sony, we're committed to inventing new formats and perfecting new standards in data media to meet changing business needs.

As new computers and new applications are developed, Sony will be developing new data media products that will hold even more information, more securely.

And we'll continue to explore the limits of data recording technology.

After all, inventing new ways of saving your business is our business.

For more information on Sony Data Media products, please call (201) 930-7025.

SONY
SONY RECORDING MEDIA

BridgePort Links Macs and PCs to LaserJets

Extended Systems has introduced the BridgePort ESI-2671A, a printer-sharing device that lets Macs and PCs connect simultaneously to Hewlett-Packard's LaserJet IID, LaserJet III, or LaserJet IIID printers. The device, a board that fits into the internal I/O slot in the printer, includes a Centronics parallel port, an ExtendedLink port, and an AppleTalk port.

When used in conjunction with the new HP LaserJet PostScript Cartridge Plus, the BridgePort ESI-2671A provides automatic language switching between PostScript and PCL (Printer Control Language for DOS machines), but only on the LaserJet III and IIID. The ESI-2671A lists for \$495 and is now shipping. Extended Systems, 406/587-7575.—T.M.



THE HP PAINTJET XL300 COLOR INK-JET PRINTER PRODUCES CLEAR IMAGES ON A WIDE VARIETY OF ORDINARY PAPERS.

HP Color Ink-Jet Prints on Plain Paper

Hewlett-Packard has unveiled the HP PaintJet XL300, a thermal ink-jet printer that can use a wide variety of ordinary papers without significant reduction in image quality. The printer uses a heating element that dries the liquid ink before it can wick away along the paper fibers.

The printer can automatically switch between HP PCL 5C (with color extensions) for DOS machines and PostScript Level 2 for the Mac. The HP PaintJet XL300 includes a LocalTalk connector, a Centronics parallel port, and an RS-422 serial port. The printer

DESKTOP LIBRARIAN

Books on Lotus 1-2-3 for the Mac

This month we focus on three books that cover Lotus 1-2-3 for Macintosh.

- *Start Here with 1-2-3 for Macintosh*, by Daniel Gasteiger and Stacy Gasteiger (1992, \$19.95). Intended for new users, this book starts with an explanation of how personal computers work, including definitions of basic terms like byte, then gives introductions to the Mac and to spreadsheets. The book is organized into short lessons and practical examples. Later chapters move on to more complex subjects. Lotus Books, (317/573-2500).

- *Using 1-2-3 for the Mac*, by Mark Bilbo and Christopher Van Buren (1992, \$24.95). Starts with an overview of 1-2-3's features and a summary of each chapter's contents. The 17-chapter book is organized into sections covering worksheets, graphs, databases, and macros. Que Corporation, 800/428-5331, ext. 6737.

- *1-2-3 for the Macintosh Made Easy*, by Mary Campbell (1992, \$19.95). Written for beginning to intermediate users. Each chapter is intended as a learning session and ends with a review and a list of keyboard commands learned. Osborne McGraw-Hill, 510/549-6600.—T.M.

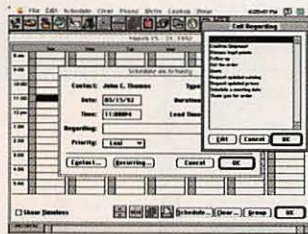


MUCH WISDOM ON LOTUS 1-2-3 FOR THE MAC.

SCOTT PETERSON

senses a file coming in via any of the three ports.

The list price of the HP PaintJet XL300 is \$3495 for the PC-compatible version; for the Macintosh a \$1995 PostScript Level 2 upgrade is required. The upgrade includes an additional 4MB of RAM, for a total of 6MB. The HP PaintJet XL300 for the Macintosh should be available this summer. HP, 800/752-0900.—T.M.



SETTING UP REMINDERS AND SCHEDULING DAY-TO-DAY TASKS ARE LARGELY AUTOMATED IN ACT.

High-Performance Bridge/Router

NETWORK RESOURCES Corporation (NRC) has introduced the MultiGate Hub 2, a combination network bridge and router that can operate locally or as a remote device via a wide-area network (WAN). The MultiGate Hub 2's integrated hardware and software make it useful as a building block for a wide variety of network applications. The hub's internal wiring can be 10BaseT or high-speed fiber optics.

The MultiGate Hub 2 starts at \$3995 for a version with zero ports and 10BaseT/AUI and BNC media. A 24-port version with the same media lists for \$5995. Various WAN and contents-addressable memory options are available, as is the fiber-optic version. The device was expected to begin shipping in June. NRC, 408/263-8100.—T.M.

New Act

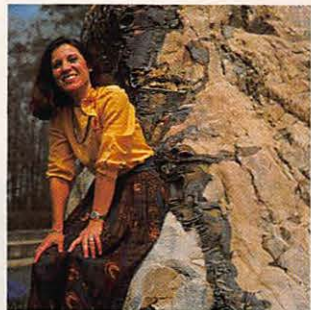
Contact Software's Act provides a contact database; a calendar and to-do list with alarms; and a text editor to generate mail merges. It can publish data to an external word processor or a pin-mapper like GeoQuery, and can record and replay repetitive procedures automatically.

For tracking organizations with multiple contacts or people associated with multiple organizations, Act has a grouping feature; people and organizations can belong to many groups.

Act's query tools include date ranges and wild cards, but Act can't search its notes field and doesn't support Boolean searches. Recurring events can be created but can't be modified as a group.

The DOS version of Act can share contact databases on a network and can be custom-

News



MANUELO PAGANELLI

DENISE WILTSHIRE OF THE USGS SUPERVISED THE AGENCY'S FIRST MULTIMEDIA SCHOLARLY PUBLICATION.

Geology Publishing

A PUBLISHING EXPERIMENT at the United States Geological Survey has produced Arctic Data Interactive (ADI), a scientific journal on CD ROM, with articles by several scientists studying the arctic; hundreds of megabytes of raw data, including aerial photographs, gathered by the scientists; and image-analysis software that lets others poke around in the data sets.

ADI's articles are accessed through a table of contents with hypertext links; raw data is accessed through a data directory that describes the files' origins and contents. ADI includes animations of sea ice, a discussion of U.S. government science policy, and a bibliography.

Arctic Data Interactive was programmed by Internetwork, 619/755-0439, under the supervision of Denise Wiltshire at the USGS. It is available free of charge to libraries and environmental researchers, 703/648-4000.—D.L.

ized by programmers. The first Mac version lacks those features and does not support AppleTalk Remote Access.

Act will list for either \$395 or \$495. Contact Software, 214/919-9500.—D.L.

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the world's most powerful recognition
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to-use program that reads virtually any
document directly into your existing
software. Best of all, *OmniPage Direct*
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Add to this the compact HP ScanJet IIp
and you have the ultimate speed
reading solution. The ScanJet IIp is
another innovation from the leader in
desktop scanners and can directly input
images and text into your applications —
for a very affordable price.

To learn more about how easy and
affordable scanning has become,
call our OCR hotline for the dealer
nearest you.

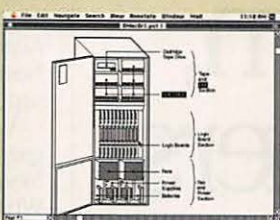
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CAERE®

Cross-Platform Documents

A WHILE BACK Adobe announced Carousel, a paperless way to publish and distribute information. Carousel has features built in to compensate for problems incurred by creating files on one kind of computer and viewing them on another—for example, it uses Multiple Master fonts to maintain the same page layout on any screen.

Now at least two Carousel competitors with Mac versions are available. Northern Telecom, whose telephone switches require tens of thousands of pages of documentation, is marketing a system called Helmsman, developed for in-house use. Interleaf, with its programable technical-document system, is creating a paperless document-publishing shell called WorldView. All three products provide a mix of navigational tools such as hyperlinks; support for various data formats including text, graphics, and CAD files; and such features as bookmarks and reader notes. Pricing depends on configuration. Adobe, 415/961-4400; Interleaf, 617/290-0710; Northern Telecom, 615/734-4000.—D.L.



SEARCHING FOR THE WORD
DISK IN A HELMSMAN
DOCUMENT CONTAINING
TECHNICAL DRAWINGS THAT
HAVE TEXT IN THEM.



ROBERT HOLMSTEN

YOU DON'T HAVE TO BE
AN ARCHITECT TO USE MINICAD:
FARHAN MALIK WITH SHIRTS
HE DESIGNED IN MINICAD.

Graphsoft's New Deal

Diehl Graphsoft is developing MiniCad+ version 4. The new version adds high-end features and has an improved interface.

New high-end features include the ability to add tolerance information and display it with industry-standard symbols; cabinet and cavalier projections for 3-D blueprints; and the ability to generate a section from anywhere in a drawing. In version 4 drafters can start working in 3-D instead of beginning in 2-D and later converting to 3-D. The new MiniCad+ has an intelligent 3-D cursor and front-plane clipping to reveal the inside of a structure, and it supports flyovers and walk-throughs. It lists for \$795. Diehl Graphsoft, 410/461-9488.—D.L.

Lights, Camera, Movie

Vision Software is shipping CameraMan, a utility for filming QuickTime movies of all that takes place on a Mac screen. This may remind some readers of Farallon Computing's MediaTracks, but CameraMan doesn't support dialog boxes for user input, branching, or other tools for creating interactive applications. Instead, CameraMan's files can be incorporated into any multimedia authoring system that supports QuickTime (it also saves in PICS).

CameraMan can capture all or only part of the screen, or can follow the mouse around, to save on file size. Unlike the tiny window for digital video in QuickTime, screen movies can be played back at full size. CameraMan comes with a QuickTime player called MoviePlayer and lists for \$149. Vision Software, 408/748-8411.—D.L.



PETER HOEY

VIRUS WATCH

CURRENT VIRUSES, TROJAN
HORSES, AND WORMS

MBDF

TYPE: Virus
**FIRST LISTED IN VIRUS
WATCH:** 6/92
INFO: Initially distributed
via trojan horse program
called Tetracycle, but can
spread like other viruses
IMPACT: Does not destroy
data; may disable
applications

Zuc C

TYPE: Virus
**FIRST LISTED IN VIRUS
WATCH:** 10/91
INFO: A Zuc clone
IMPACT: Nondestructive;
infects applications and
system files; renders cursor
inoperable

HC

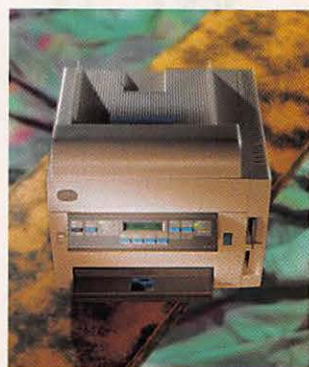
TYPE: Data Virus
**FIRST LISTED IN VIRUS
WATCH:** 6/91
INFO: Infects HyperCard
stacks
IMPACT: Causes the Mac to
hum oddly

Low-Cost 040 Accelerators Cut Out the FPU

Fusion Data Systems has introduced two low-cost 68040-based accelerators for the IICI, the IISI, and the SE/30. Both accelerators use a less-expensive version of the Motorola chip. Intended for those users who don't need the benefit of the FPU (math coprocessor) built into the standard 68040, the 25MHz accelerators are the TokaMac CI 25i for the IICI and the TokaMac SX 25i for the IISI and Macintosh SE/30. Both PDS boards list for \$1695, about \$1500 less than similar TokaMac accelerators that include the FPU, according to the company.

Applications for the 25i accelerators include desktop publishing, raster-image processing, and graphic design. Both

News



ALEX VIARNES

THE IBM LASERPRINTER
10A FROM LEXMARK PRODUCES
10 PPM AT 600 DPI.

Lexmark Laser Printers Produce 600 dpi

LEXMARK INTERNATIONAL, the printer-manufacturing arm of IBM, has designed several new PostScript printers that work with the Mac. The printers, called the IBM LaserPrinter 10A and the IBM LaserPrinter 6A, print 10 ppm and 6 ppm, respectively. The 10A prints at 600 dpi, using a 68020 processor for extra speed. The 6A includes a 68000 processor and produces 300 dpi, upgradable to 600 dpi. Both printers come with 39 fonts, desk accessory software for System 6 and System 7, and a 200-sheet input tray.

The printers are the first from Lexmark to come pre-configured for the Mac. The LaserPrinter 10A lists for \$3995, while the LaserPrinter 6A lists for \$2695. Both are now shipping. Lexmark, 800/426-2468; 800/633-7662 in Canada.—T.M.

models allow software switching between the 040 and the Macintosh's native 030 processor. The TokaMac CI 25i and TokaMac SX 25i accelerator boards began shipping in April. Fusion Data Systems, 512/338-5326.—T.M.

In Tinsel Town, we're the printers to the stars.



Oscar statuette © AMPAS. ®

When C. David Piña created the graphics for the 63rd Annual Academy Awards, he cast his NewGen™ printer to play a vital supporting role.

Why NewGen? "We print a lot of grey scale, line and type images. NewGen delivers — beautifully. What I see on the screen is precisely what I get. And it's fast too; we don't wait for documents anymore."

Resolution close up,
13 point Courier enlarged 500%.



Standard 300 dpi Turbo PS/840e

With features like Image Enhancement Technology (IET)™, NewGen delivers some of the smoothest lines, characters and curves since *Casablanca*. Plus, Automatic Recognition Technology (ART)™ which actually selects the right interfaces and emulations for you. "And it's got Program Updating, so my printer stays virtually obsolescence-free. And that's important in this business."

As for NewGen technical support, Piña put it this way, "We've never had problems, only a few questions, and they were there — instantly."

The NewGen line offers a complete cast of PostScript®-compatible printers to fill any role. With resolution from 300 to 1200 dpi plus IET. A range of speeds from 4 to 12 pages per minute. Even paper sizes of up to 11"x17" for simply unequalled graphics and pre-press capability.

All at prices that will make you a star with accounting.

Piña summed up his choice eloquently. "The NewGen was the only printer that offered everything I needed — with features I couldn't get from anyone else."

To learn more, or for your nearest NewGen Dealer, call 1-800-756-0556. We'll be happy to show you just how well our high-resolution printers can play a leading role in your business.



The Hi-Res People™

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17580 Newhope Street, Fountain Valley, CA 92708

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Dealer Inquires Welcome

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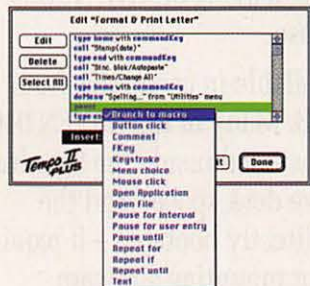


DRAKE SOREY

LAETITIA SONAMI CONTROLS A STACK OF MIDI EQUIPMENT BY FLEXING A GLOVE EMBEDDED WITH ELECTRONICS.

Digital Improvisation

Electronic composer Laetitia Sonami's concerts are both scored and improvised. Using a Mac SE and Opcode System's object-oriented music software, Max, Sonami creates the basic harmonic, rhythmic, and melodic parameters of a piece, which are sent to synthesizers and samplers as MIDI commands. She improvises within these parameters, using her voice and a special pair of ladies' gloves as MIDI controllers. The gloves are equipped with sensors that measure the magnetic field between her thumb and fingers and translate the measurements into MIDI data. Sonami will perform in New York, San Francisco, and other cities this year. For dates, call 510/532-5666.—ANN GARRISON



TEMPO'S NEW MACRO EDITOR LETS YOU MODIFY A MACRO LINE BY LINE AND CHOOSE STEPS FROM A POP-UP LIST.

Up Tempo

AFFINITY IS upgrading its general-purpose macro recorder, Tempo, to Tempo II Plus version 3. Among its major new features are the ability to issue and respond to Apple events, a new macro editor, and improved support for externals. Files and folders used in externals can be selected from a standard file dialog

TREND

Coordinated Colors

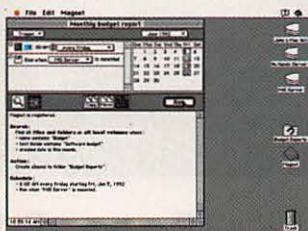
MAINTAINING CONSISTENT colors from original artwork to final printed piece is the most difficult problem faced by publishers—desktop and traditional alike.

Electronics for Imaging's Efi-Color is intended to make possible consistent, predictable color printing. EfiColor is system-level software that understands the color characteristics of each device involved in a publishing job and can map colors accurately between scanners, monitors, proof printers, and color separators.

While trying to persuade Apple and other companies producing electronics used in the printing industry to adopt EfiColor, EFI is also marketing Cachet, a \$595 EfiColor-based color-matching and -correction application for the Mac. EFI, 415/742-3400.—D.L.



EFI'S CACHET. THE IMAGE ON THE RIGHT IS A REFERENCE IMAGE FOR CALIBRATING COLORS ACROSS DEVICES.



SETTING UP MAGNET TO AUTOMATE THE WEEKLY UPLOADING OF BUDGET FILES TO A SERVER.

Automating the Finder

No Hands Software is developing Magnet, a System 7 utility intended to cut down on time spent supervising your Mac. Simply put, Magnet creates folders full of aliases of the files you use. For example, it could create an Apple menu item listing all your applications; log on to a server and open a database (even over phone lines); or keep a folder of aliases of every file you've used in the last 30 days.

In Magnet's editor you can set up more-complex tasks. For example, once a month it could locate files with the word *Invoice* box, instead of by typing in path names. In the editor, macros can be modified line by line, and many commands and procedures can be inserted from a pop-up menu.

Tempo II Plus 3 will list for \$179.95. Affinity Microsystems, 303/442-4840.—D.L.

in the title and *Delinquent* in the contents, and upload them to the accounts receivable server.

No Hands expects Magnet's street price to be less than \$150. No Hands Software, 415/321-7340.—D.L.

I Swim, Therefore I Am

Consciousness of self characterizes homo sapiens, primates, and even dolphins. At Honolulu's Earthtrust, zoologist Ken

News



DR. KEN MARTEN (FOREGROUND) AND SUCHI PSARAKOS OF EARTHTRUST, WITH DOLPHINS PUNA (TOP) AND MAUI.

Marten has data suggesting that dolphins recognize themselves in mirrors. He will soon give several dolphins the power to control lights and water showers and to dump toys into the water by touching their rostrums against an underwater touch screen connected to a Mac II. Earthtrust's intent is to explore the intelligence of dolphins and inform people about dolphins in the hope of stopping what Marten calls "the holocaust" now destroying these creatures. Earthtrust, 808/254-2866.—ANN GARRISON



BUG REPORT

Quicken 3.0: A conflict with Suitcase II 2.0 interferes with display of some fields. Version 3 release 3 and later versions solve this problem; Intuit will supply a bug fix at no charge to registered users upon request.

Radius Color Pivot: If Pivot is turned to landscape mode at start-up, the Finder doesn't display color (problem only occurs with built-in video). Radius is not sure if it can fix the problem with software; it may need to be fixed by Apple in system software.

NightWatch II: Sometimes, NightWatch II locks authorized users out of drives formatted with FWB's Hard Disk Toolkit and Casa Blanca Works' Drive7; Kent Marsh says it knows how to fix the bug but at press time was not sure when the bug fix would be ready.

FolderBolt 1.0: FolderBolt is incompatible with some operations in Microsoft Word 5; bug-fix version 1.02b will be available free online or from Kent Marsh with a shipping charge.

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Time-Proven Performance!



What Started Out Fast, Is Now Even Faster. RAVEN-040 for the Quadra – The Next Generation of High Performance Disk Arrays.

Last year MicroNet introduced the RAVEN-030 series of disk arrays. With 4.4 MB/sec sustained data transfers, nothing was faster. This year, we're offering the ultimate in transfer rates – up to 7.0 MB/sec with our new RAVEN-040 series compatible with the Quadra 700 and 900.

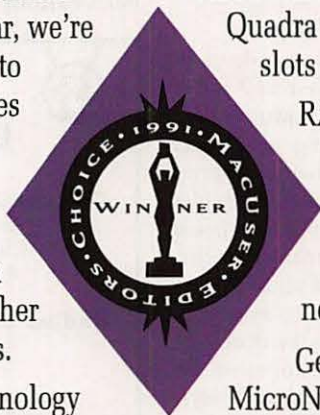
Using MicroNet's new SCSI Manager, RAVEN-040 is capable of synchronous data transfers. No other system offers such exceptional throughput speeds. And no other system offers access times as fast as 5.7 ms.

Based, in part, on the time-proven technology which won MicroNet the MacUser Editors' Choice Award for 1990, RAVEN-040 for the Quadra 900 goes

a step beyond what was achievable through NuBus-based configurations. It connects directly to the Quadra 900's SCSI ports, leaving all five NuBus slots open for other use.

RAVEN-040 is available in capacities from 606 to 4,260 MB. Many of the RAVEN-040 pairs can be installed inside the Quadra 900 to conserve desk space. And the RAVEN-040 is directly bootable – it requires no special INITs or mounting software.

Get the time-proven performance of MicroNet's next generation of disk arrays. Call our sales department today for information on the powerful new RAVEN-040. 1-714-837-6033.



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RAVEN-030 and RAVEN-040 are trademarks of MicroNet Technology, Inc. All other trademarks are the property of their respective owners.

Circle 113 on reader service card

Farallon Broadens Ethernet Line

FARALLON Computing introduced a broadened line of Ethernet boards to suit more Macintoshes and offer more choices of network-cabling media. The new series of 16 boards, called EtherMac, includes 3 models for Nu-



JOHN WILLIAM LUND

THE RELISYS RE-2058 IS AN AUTOSCANNING MONITOR WITH RESOLUTIONS UP TO 1024 BY 768.

Relisys Hi-Res 20-Inch Monitor

Relisys has introduced a 20-inch color monitor that displays 640 by 480 pixels or 1024 by 768 pixels and lists for \$1795. Called the RE-2058, the monitor automatically adjusts to scanning frequencies ranging from 31.5kHz to 58kHz, to work with a wide range of graphics adapters from different vendors. It supports screen refresh rates of up to 90Hz.

The RE-2058 also has an external degaussing control for eliminating color impurities that are caused by ambient magnetic fields. The monitor is shipping now. Relisys, 408/945-9000.—T.M.

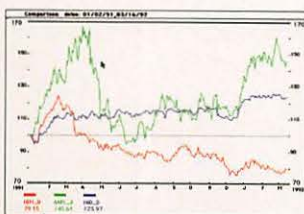
Bus Macs: a \$249 version for Thinnet/AUI media, a \$249 version for 10BaseT/AUI media, and a \$329 version for Thinnet/AUI/10BaseT media. The 6 models for the LC offer either Thinnet or 10BaseT or both, plus they come with either a socket for an FPU or a \$150 FPU installed. Prices for the LC series start at \$249. The 6 models for the IIsi and SE/30 offer the same media combinations as the NuBus boards. These models start at \$299 and have the same \$150 FPU option as the LC versions. A single \$329 model for the Macintosh SE can connect to all three media types.

All the models have at least a 16K buffer, except the SE model, which has an 8K buffer. All the EtherMac boards are available now. Farallon, 510/596-9000.—T.M.

Making Sense of Securities

Dow Jones Market Analyzer Plus 2.0 provides a wide range of technical tools for analyzing and predicting trends of stocks, bonds, and other securities, including point and figure charts, support and resistance line charts, and moving average convergence-divergence charts. Its reports are modifiable, and expert users can add their own formulas.

Market Analyzer Plus lists for \$349 and is designed to work with the Dow Jones News/Retrieval Service, an on-line system that maintains a



A MARKET ANALYZER PLUS GRAPH COMPARING 1991 STOCK PRICES FOR APPLE, IBM, AND THE DOW JONES INDUSTRIALS.

wide range of current and historical information about securities. All activities can be automated, including going online to retrieve quotes. Market Analyzer Plus can update the database in Dow Jones's Market Manager Plus, avoiding double online charges. Dow Jones & Co., 609/520-4000.—D.L.

Low-End OCR

WHILE DEVELOPING the new OmniPage Direct, people at Caere took to calling it BozoScan. For good reason: OmniPage Direct is so simple it's almost invisible. It appears as an Apple menu item that runs inside other applications, and saves its output into other applications' files.

It has a few simple tools for selecting parts of a page based on a quick prescan; recognizes and retains point size and font (if the correct font is installed); and understands the difference between columns and tables. Because it does not create its own files, OmniPage Direct has no spelling checker and can't batch-process scans.

OmniPage Direct lists for \$595 and requires System 7. Caere, 408/395-7000.—D.L.

New E-Mail

SoftArc's FirstClass is a full-featured E-mail system designed so that all features available over a local network are also available by modem. It works asynchronously, meaning that it can send and receive messages or files at the same time.

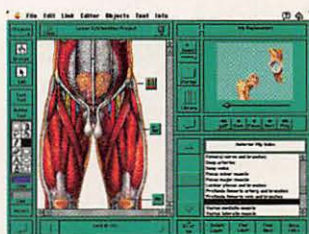
Other features include conferencing; tracking of who has and has not read a message; a chat mode; multiple forms; and support for making a network

News

Anatomy Lesson

ADAM—Animated Dissection of Anatomy for Medicine—is a human being on a CD ROM who can be taken apart by medical students, pharmaceutical salespeople, and nervous presurgery patients. It is built in layers, each of which represents a different part of the anatomy such as the vascular, nervous, and skeletal systems.

ADAM is being developed in stages. The lower extremities are shipping, with the abdominal region scheduled for summer. A woman's body (Eve) is in the works, and elderly and children's bodies are planned. The system is built on SuperCard, with scripts open for modification by users who want to add their own text, scanned images, hot links, and so on. It is available by individual modules or on subscription; price varies. Adam Medical Software, 404/980-0888.—D.L.



MUSCLES OF THE TORSO AND UPPER LEGS. ON THE RIGHT, A QUICKTIME MOVIE OF A HIP REPLACEMENT OPERATION.

volume accessible.

Version 2.0, due this summer, will have a programming interface for third-party add-ons; editable forms; and rich-text support.

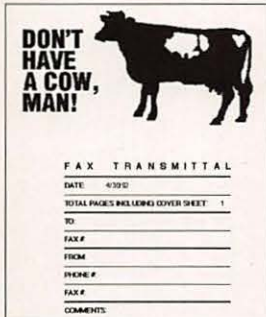
A five-pack for local area networks is \$295; unit pricing goes down for larger installations. Software for modem-only access starts at \$295 for 100 users and goes down for larger installations. SoftArc, 416/299-4723.—D.L.

JUST FOR FUN

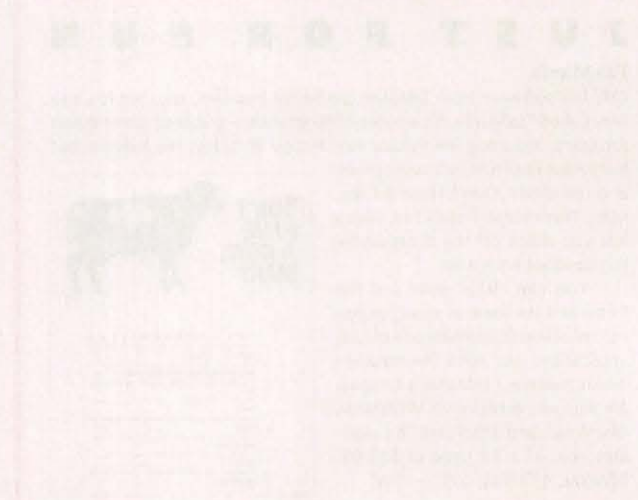
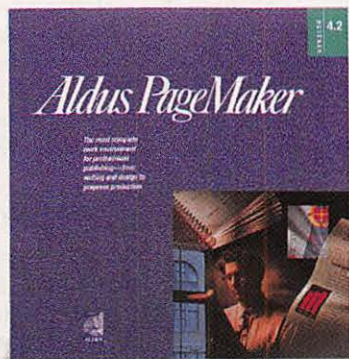
FaxMania

OK, this software from T/Maker can be for business, too, but it's also fun. Called FaxMania, it's a series of 80 attention-grabbing cover sheets for faxes, including the Rumor Fax, Happy Birthday, the hideous but humorous Fax From Hell cover sheet, and the classic Don't Have a Cow, Man. There's also Flower Fax, which lets you check off the occasion for the bouquet from a list.

You can either print out the forms and fax them as usual, or you can enter text from inside one of four applications and send the message via fax modem. FaxMania is compatible with Microsoft Word, WriteNow, MacWrite, and MacPaint. It's available now at a list price of \$69.95. T/Maker, 415/962-0195.—T.M.



THE SOFTWARE.



THE HARDWARE.



We could tell you that year after year, Aldus® PageMaker® has set the standard for page layout programs—for both Macintosh and Windows.

■ We could tell you that our latest version, Aldus PageMaker 4.2, is better than ever. It now has a Control palette to numerically position, move, and resize objects. Plus “nudge” buttons for precise adjustments. ■ We

could tell you that PageMaker 4.2's enhancements give you the power you need to express your ideas. ■ Or we could simply point above, and show you what the experts have to say. (We might add that PageMaker is also *MACWORLD's* 1992 choice for best all-around page layout program.) ■ For information, call 1-800-685-3625. And see why our software is attracting so much hardware. ●

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—Joseph Schorr, Macworld, April '92

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Note: We're adding two exciting new capabilities, concurrent voice communication and caller identification. These features are not yet available from any modem manufacturer, but as soon as the technology permits (estimated to be third quarter of '92), we will offer it in an easy upgrade to our Xeba line. Caller identification may not be allowed in all states.

Circle 93 on reader service card



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MACHINIST LABORING OVER
EQUIPMENT USED TO MAKE
RAILROAD CAR PARTS.

The Engines of Change

A Pennsylvania farmer and mill owner penned this advertisement in 1849: "...The subscriber will sell... Water Power, Grist and Saw Mill... the site would be a very superior one for a woollen or cotton Factory... This water power is one of the best for manufacturing purposes in Chester county, and is well worth the attention of capitalists." The ad appears in Steven Lubar's HyperCard stack *The Engines of Change*, which details the transformation of the United States between 1790 and 1860. Text and artifacts are drawn from an exhibition Lubar curated at the Smithsonian Institution's National Museum of American History. Intellimation, 805/968-2291.—ANN GARRISON

Under New Management

By acquiring Peter Norton Computing, Symantec became the owner of two of the Mac's leading disk-management packages, Symantec Utilities for Macintosh (SUM) and The Norton Utilities for the Macintosh (NUM). Symantec had to make a choice and it chose NUM, but the company says the new NUM 2.0's engine incorporates all the disk-recovery technology of SUM.

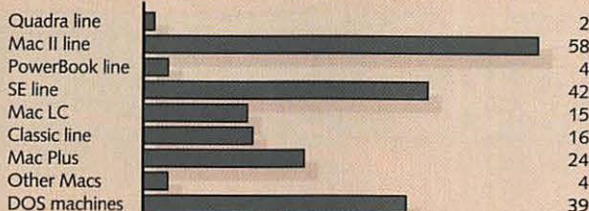
Other SUM features include disk partitioning and data encryption. Version 2 adds a backup utility and the ability to recommend routine maintenance tasks for a hard drive. Version 2 also installs Wipe-Info, a trash can that makes deleted files unrecoverable.

NUM 2.0 will list for \$149. Upgrades from earlier versions of NUM or from SUM are \$39. Symantec, 408/253-9600.—D.L.

Survey: Systems in Use

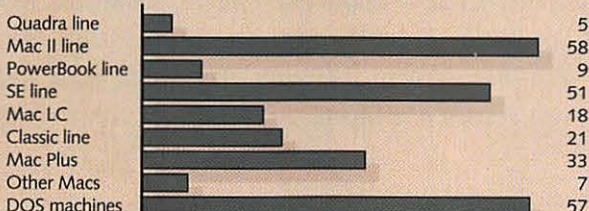
Computers Used by Macworld Subscribers

Total percentage of subscribers using Macintosh computers: 97

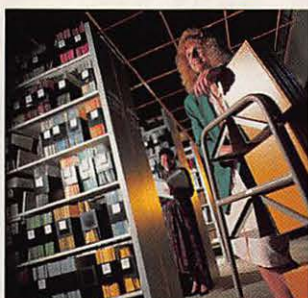


Computers Installed at Subscribers' Organizations

Total percentage with Macintosh computers installed: 82



Based on two surveys mailed to 2000 readers each, with response rates of 68 percent and 74 percent. (Percent totals do not equal 100 due to multiple responses.)



ROSEANNE MACEK (FOR-
GROUND) AND LYNNE BIDWELL,
TWO LIBRARIANS AT APPLE'S
HIGH-TECH IN-HOUSE LIBRARY.

Apple's High-Tech Library

LIBRARIES OF tomorrow may be much like Apple's library today. Without a single card file, its staff helps Apple employees search electronic databases of the corporate collection and the collections of hundreds of other libraries, information brokers, corporate report centers, and document vendors. The library's lab provides tools for accessing the nonprint collection, and for scanning, digitizing, and transferring files, and color printing. Though the Apple Library is for employees only, it sponsors the Apple Library Users Group

(ALUG), which is open to public, academic, and corporate librarians, and individuals interested in using Apple computers to manage information. ALUG, 408/974-2552.—ANN GARRISON

Mirror Does Laser Printers

Hardware vendor Mirror Technologies has unveiled its first printers, the MirrorImage 309 and the MirrorImage 415. Both include PostScript Level 2. The MirrorImage 309 produces 300-dpi output at 9 ppm; the MirrorImage 415 produces 400-dpi output at 15 ppm, and handles tabloid paper. Both come with a Weitek RISC processor, 35 fonts, and a SCSI port for attaching an external hard drive.

The printers have an AppleTalk connector, a serial port, and a parallel port, all of which can be active at the same time to support Macs and DOS machines. The MirrorImage 309 lists for \$1699 including 2MB of RAM, while the MirrorImage 415 lists for \$4499 with 4MB of RAM. The company expected to begin shipping both in May. Mirror, 612/633-4450.—T.M.

News

NewGen's 800-dpi Laser Printer

NewGen Systems Corporation has introduced the TurboPS/880, an 8-ppm laser printer that uses controller techniques to produce 800 by 800 resolution. The printer has enhanced grayscale capability, a RISC processor, and 10MB of RAM.

Interfaces include an Ethernet adapter, a serial port, a parallel port, and an AppleTalk connector, all simultaneously active. The printer senses whether a file is PostScript, PCL 4, or HPGL. It can be upgraded to future versions of the various page-description languages. The TurboPS/880 has a SCSI port for a hard drive. Now shipping, the printer lists for \$5995. NewGen, 714/641-8600.—T.M.



BETA WAIT

Long-awaited products

ACIUS's 4D Server

Shown publicly January 1991. Current ship date projected: spring 1992 in France, three months later in United States.

FoxPro/Mac

Discussed publicly winter 1990/91; Fox says will go to beta soon, no ship date projected.

Interleaf 5

Discussed publicly October 1990. Current ship date projected: summer 1992.

Clarix's MacWrite Pro

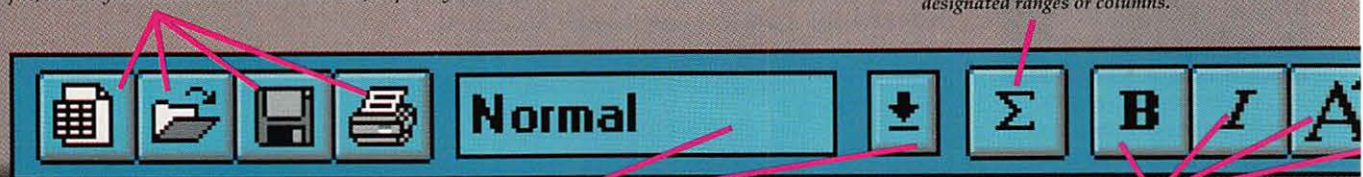
Announced spring 1991. Current ship date projected: late summer 1992.

AEC's FilePower

Announced August 1991; planned to ship winter 1991/92. Current ship date projected: summer 1992.

Microsoft Excel 4.0 – See

Click on these handy icons to create a new file, open an existing file, access your disk drives and directories, or print your work.



Click on the Autosum icon to sum designated ranges or columns.

Set your style sheets, then simply pull down this menu to choose and apply them.

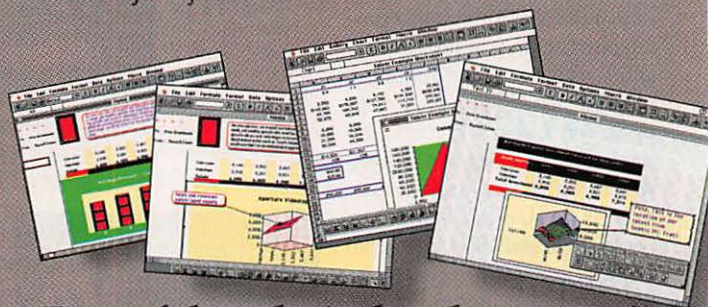
Use these icons to change typestyles, or reduce or enlarge type.

Microsoft Excel for the Macintosh just got even better. The new version 4.0 adds to this already incredible program by giving you more powerful features that make everyday spreadsheet tasks easier than ever. Even more important, Excel 4.0 offers a whole new wealth of built-in intelligence features. So Excel can actually anticipate the kind of information you'll want, and then present it to you. And Excel 4.0 is designed to share information with other kinds of documents, and even across platforms. And that's just for starters!

A whole new level of easy.

Believe it or not, you can actually create a spreadsheet in just about 60 seconds with Microsoft Excel 4.0. New intuitive features replace the long, steep learning curve with quick and powerful commands that have you up and running in a flash!

- Use Excel's customizable **Toolbar** for one-step, on-screen access to the commands you most frequently use.
- **Autosum** lets you sum designated ranges or columns with a simple double-click.
- **Autofill** recognizes trends in your data, and extends them as far as you'd like.
- **Shortcut menus** pop up to give you instant access to common, context-sensitive commands.
- **Best Fit** automatically resizes columns to accommodate the widest entry.
- And the incredible new **Wizards** are always watching and waiting in the background, ready to guide you step-by-step through any complex task.



Powerful analytical tools put you in touch with your data.

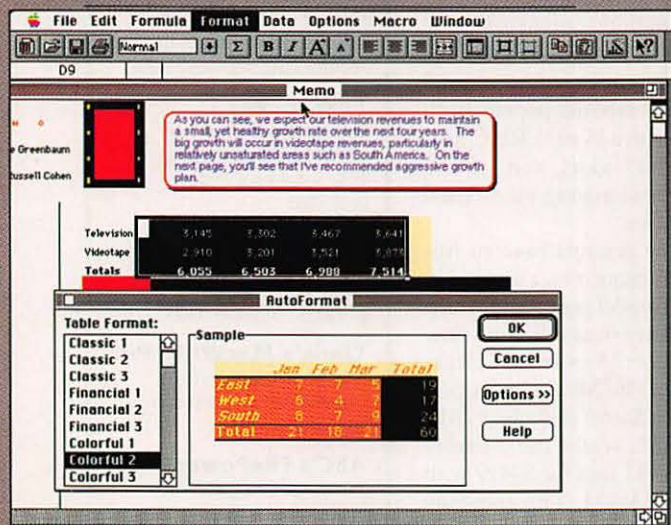
Microsoft has added a host of new analysis tools to Excel 4.0, giving you entirely new ways to view and analyze your data.

- Use the **Crosstabs** feature to create crosstab tables based on database entries that you can sort by any criteria.
- Store related worksheets together in a single file with **Workbooks**.
- **Consolidate** data from multiple worksheets, regardless of formatting, file type, or file location.
- The **Analysis ToolPak** includes the most extensive set of financial, statistical, engineering, and scientific tools that you will find in any spreadsheet.
- **Outlining** lets you expand or collapse your worksheet to view the desired level of detail.
- Plus the extraordinary **Scenario Manager**, which lets you create and save multiple "what if" scenarios and create a summary of these scenarios in just minutes.

Improved graphics tools and presentation support

Excel 4.0 gives you even greater control over how your finished documents will look. It provides everything you need to create dazzling reports, complete with charts, graphs, and notes or annotations.

- **Autoformat** gives you one-step access to 16 professionally designed spreadsheet formats.
- **Report Manager** lets you merge different sections of different spreadsheets to produce customized reports that you design.



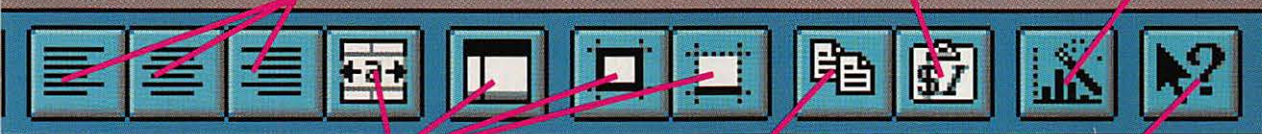
Autoformat lets you choose from 16 attractive, professionally-designed formats. Then apply the format you select to your worksheet with just a single mouse click.

how easy power can be!

Your choice of alignment options — left, right or centered — are only a mouse-click away.

Click on this icon and your selected data will be copied right to the Windows clipboard.

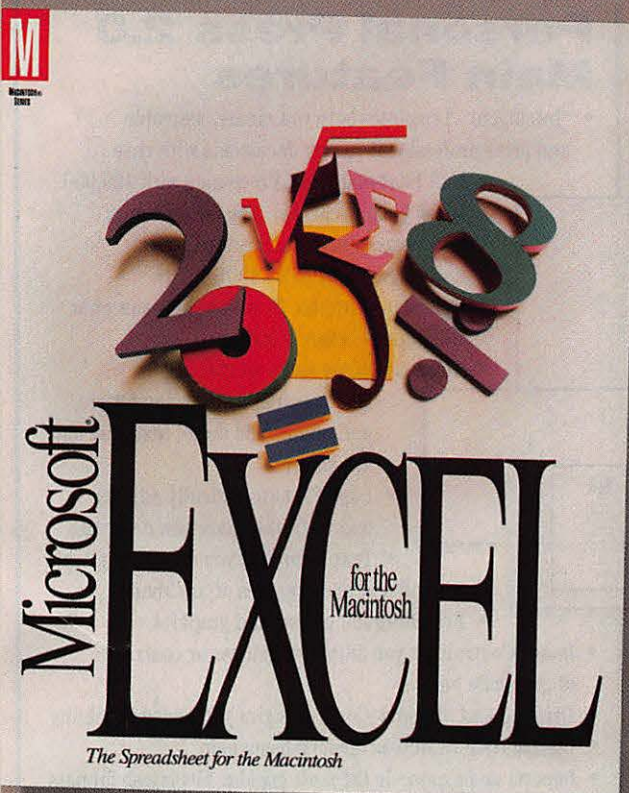
Choose this icon, and you'll have a whole range of charting features at your disposal.



These formatting tools make it easy to add bars, outlines, underlines or borders anywhere on your spreadsheet.

Switch back and forth between spreadsheets with a simple mouse click here.

To access Excel's context-sensitive, on-line help, just double-click on this icon from wherever you are in the program.



- **Charting** lets you choose from over 90 chart options, including 3-D surface charts, wire charts, and radar charts.
- **Drawing** tools make it easy to highlight and annotate your spreadsheets and graphs with arrows, ovals, arcs, or rectangles, — all in one easy step.
- Use the built-in **Spelling Checker** to ensure that all your presentations and reports are letter perfect.

Smooth transition from Lotus 1-2-3

Excel's Custom Help for Lotus 1-2-3 lets you use your familiar 1-2-3 commands right within Excel. Excel will demonstrate its equivalent command, so you can learn as you work. Lotus files and macros can be imported right into Excel, and the program supports all Lotus file formats, so it's easy to convert your documents. Plus, there's a helpful, on-line tutorial for 1-2-3 users who want to switch without a fight.

Discover for yourself how easy spreadsheet power can be.
Order Microsoft Excel 4.0 today!

Microsoft Excel 4.0

BUS0223

Publisher: Microsoft

Suggested Retail: \$495

\$295

System requirements: 1 MB RAM (2 MB for System 7.0); hard disk drive: Finder 6.1 or later; System 6.0.2 or later.

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Qualifying products are any previous versions of Microsoft Excel. Offer expires 9/30/92. Note: if you purchased Microsoft Excel 3.0 after 2/15/92, the upgrade to version 4.0 is free, direct from Microsoft.

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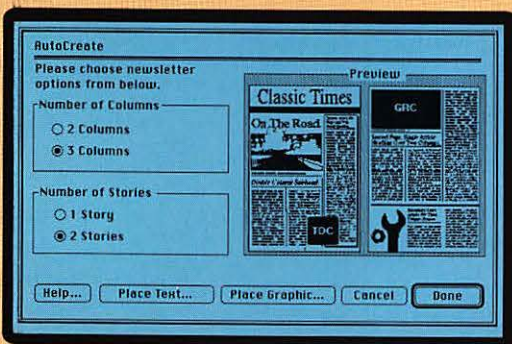
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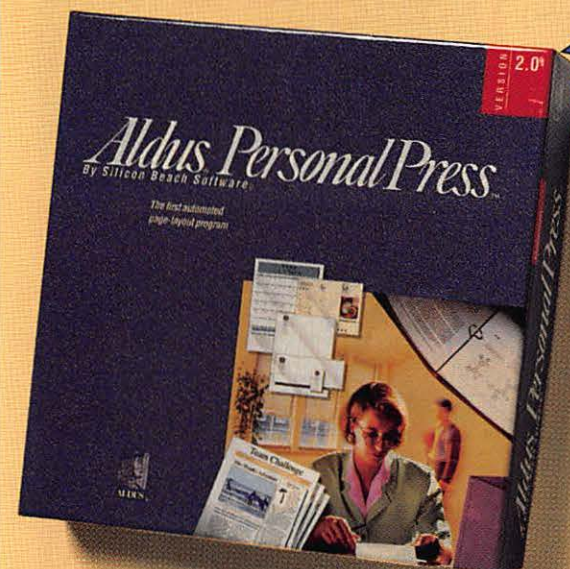
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Publisher: Aldus

Suggested Retail: \$199

System requirements: Mac Plus or higher (including PowerBook family and Quadra); System 6.0.3 or later (6.0.5 or later recommended); 1 MB RAM (2 MB recommended); hard disk drive.

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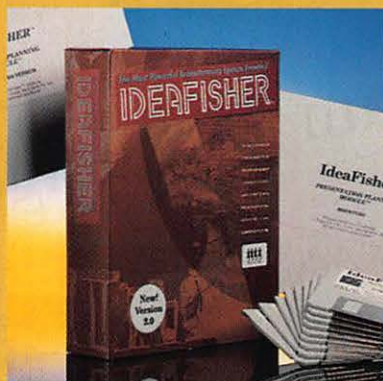
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\$389



Sprout!

Sprout! is a complete computer planning tool for vegetable gardeners. Its unique planting tool snaps to correct row and plant spacings and automatically fills in plant symbols, producing a graphic, scalable garden plan. In addition, Sprout! contains a fully editable database of vegetables for 7 climate regions containing: planting and harvesting times, yield, soil PH, growing tips, and other information. Standard text and drawing tools are included allowing users to create their own vegetable symbols and customize garden designs. Sprout! prints out garden layouts, calendars, shopping lists, and reports. **Publisher: Abacadata GRA0339**

\$45



Active Memory 2.0

Finally, a feature-rich personal information management (PIM) program designed for networks! Active Memory includes a mini-calendar, a free-form approach to contact management and dynamic reminders-the bonus is that Active Memory can be used for all of these purposes and share these features over a network. Use it to manage personal info as well as projects involving other users on a LAN. Active Memory features also include publish/subscribe, import/export, multi-level sorting and auto-phone dialing. And it's System 7.0 Savvy too! Great for Powerbook users. **Publisher: ASD Software BUS0207**

\$125

TrueLaser Printer



The TrueLaser is Microtek's answer to fast and versatile laser printing. It offers 300 dpi resolution, comes with 35 built-in True Type fonts and is PostScript and HP PCL4 compatible. Its autoswitching capability allows it to change automatically between its AppleTalk, Centronics and RS-232C interfaces. The TrueLaser is also one of the fastest printers in its class. It's powered by the AMD 29000, 32-bit microprocessor and comes standard with 2M of RAM and can be upgraded to 3MB or 6MB. **Manufacturer: Microtek INP0162**

\$1399



WristSaver/ WristSaver MousePad

The WristSaver cradles your wrist with a contoured neoprene rubber pad and a nylon covering. It's ergonomically designed to support your wrist at the proper angle to help avoid the pain associated with Carpal Tunnel Syndrome. The WristSaver MousePad provides a comfortable rest for your wrist, plus a conventional mouse pad. Simple finger movements replace sliding the entire arm or hand. **Manufacturer: LB Innovators WristSaverMousePad ACC0635 \$15. WristSaver ACC0560 \$15. Bundle BND0033 (Available in Gray, Black, Red or Navy)**

\$25



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Turn your modems, printers, plotters, and other serial devices into shared resources on your AppleTalk network. HayesConnect is the software solution that expands the usefulness of your peripherals by enabling you to share a wide variety of serial devices connected to Macintosh® computers on any AppleTalk® network. Sharing resources on your network gives you greater versatility, convenience, and cost control. For example, HayesConnect allows you to share the use of high-speed modems among many network users. No need to buy modems and phone lines for everyone; simply use HayesConnect to pool a few modems for the use of everyone in your group. **Publisher: Hayes COM0095**

\$89

NEW

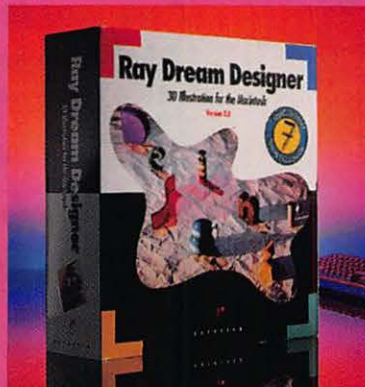
WindoWatch 1.52

Track the hours you spend on a project with WindoWatch. It's a must for professionals who bill their services by the hour (or minute). WindoWatch operates in the background, automatically generating a timesheet as you work. Use WindoWatch to collect and merge timesheets from team members over the network or export timesheet information to a spreadsheet. Don't miss any opportunity to accurately bill your clients. After all, time is money. **Publisher: ASD Software UTI0264**



Single User

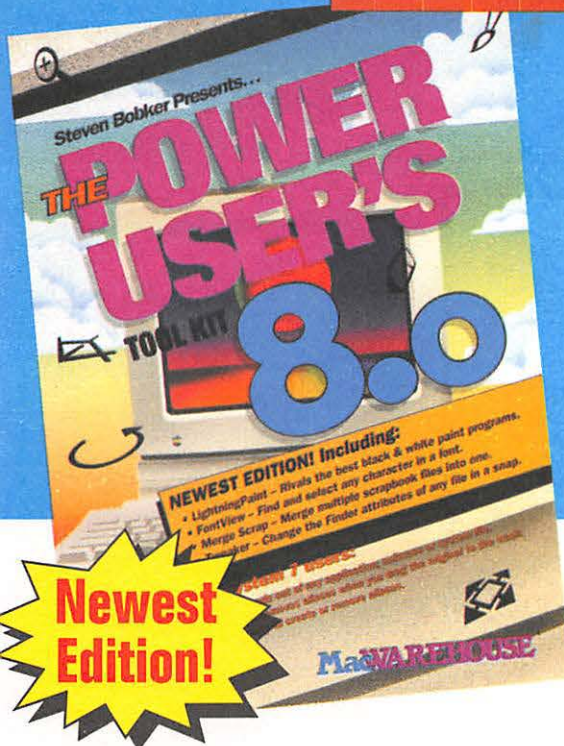
\$89



Ray Dream Designer 2.0

You don't have to settle for flat illustrations and designs any longer. Ray Dream Designer's drawing and text tools, for creating lines, circles, ellipses, polygons, Beziars, colors and shadings, are virtually the same as those in most 2D illustration programs. The only difference is, now your objects have the realistic look of three dimensions. Wrap them around an object or text for instant dimension. Comes with a library of 3D solid textures you can use as-is or customize. Lighting, shadows, transparency, reflections and, best of all, perspective are all handled automatically. Requires: Mac II family with coprocessor, 32-bit QuickDraw, 4MB RAM and hard drive. **Publisher: Ray Dream GRA0292**

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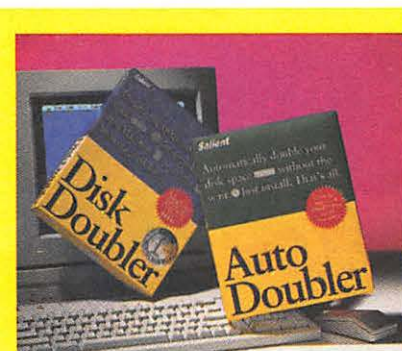
- LightningPaint**—A powerful black & white paint program with features to rival the best.
- FontView**—Find and select any character in a font, no matter where they are hidden.
- Merge Scrap**—Merge multiple scrapbook files into one.
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Especially for System 7 users:

- **Sound Extractor**—Copy sounds out of any application, suitcase or system file, and convert them to a format you can use elsewhere.
- **Trash Alias**—Automatically removes any aliases you've created for a file when you drag the original to the trash.
- **AppleEase**—The easiest way to create or remove aliases.

And much more!

12 of the programs are shareware, so you can try them free of charge. If you wish to continue using them, the authors ask that you pay a small fee (\$5-\$15). 12 of the programs are absolutely FREE! All of the details are explained on the disk, which is yours to keep. Ask for item #AAA 0019 when you place your order. *\$1.50 postage and handling charge applies.



AutoDoubler

AutoDoubler is the easiest way to increase your hard disk capacity. It works in the background to automatically keep your hard disk compressed. It's lightning quick and completely transparent, so it won't interrupt your work. In fact, AutoDoubler's new patent-pending technique lets your Macintosh use files and applications while they are still compressed! It's fully compatible with almost all applications, desk accessories, and system extensions. UT10254 \$49.

DiskDoubler 3.7

DiskDoubler gives you total control of file compression—archiving for modem transfer, compressed backups, self-expanding files, and fast copying of files. AutoDoubler and DiskDoubler combined give you the ultimate in speed, convenience, and control. System 7 Savvy! Publisher: Salient UT10179

\$49

ScanMaker 600ZS

Unbeatable features at an unbelievable price. The ScanMaker 600ZS captures 24-bit color, 8-bit gray and black and white images at resolutions up to 600 dpi. It's perfect for all work from comps to final prepress projects. Also, it comes with a built-in Apple SCSI interface for easy installation and some of today's most useful graphics software. Included with the scanner is the full version of Adobe's Photoshop, the Scanmaker plug-in and Savitar's Scanmatch color calibration software. Manufacturer: Microtek INP0180



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Aldus SuperPaint or Aldus Gallery Effects*



Aldus SuperPaint 3.0

Five time winner of MacWorld magazine's World Class Award, new Aldus SuperPaint combines painting, drawing, and image enhancement, and includes 1 thru 24 bit color, textures, gradients, and EPS graphics. GRA0112 \$133.

Publisher: Aldus
GRA0279



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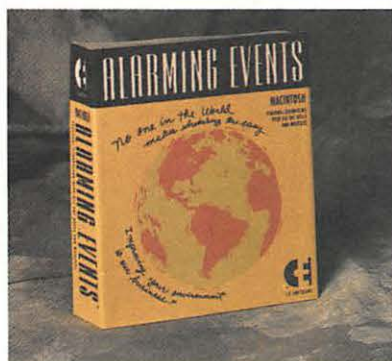
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Publisher:



CE SOFTWARE

The UnMouse

The UnMouse does everything a mouse can—only faster, easier, and in less space. To move the cursor, simply slide your finger over the glass surface. To make a selection merely press down. The UnMouse also serves as an extended keyboard. Tap the large red button and you have a Power Keypad with 16 keys instantly available to execute macros (60 in advanced mode). With its one million touch points the UnMouse also performs as a small graphics tablet. Manufacturer: Microtouch INP0084



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It's M.A.D.! It's More After Dark—Over 25 incredible new displays for After Dark, the Ultimate Screen Saver. Features contest winners; Mowin' Man, Tunnel, GraphStat, many beautiful new Fish!, Kittens, Art Museum, and Lunatic Fringe game module help save you screen form phosphor burn-in. (Requires After Dark.) UTI0230 \$25.

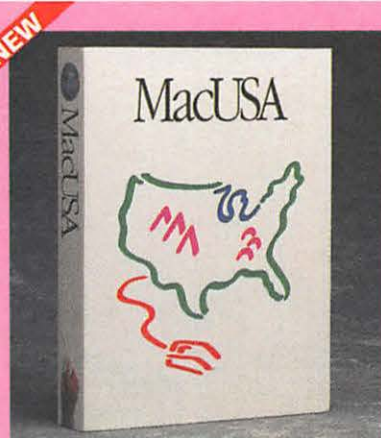
After Dark 2.0

After Dark 2.0 displays over 35 screen savers including the classics, such as Flying Toasters and Fish!. Includes sound, password protection, logo and message display. Publisher: Berkeley Systems UTI0119 \$29.

More After Dark Bundle

Buy both and save. UTI0231

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MacUSA

Every Mac user who wants fast, accurate information on the 50 states and Puerto Rico, coupled with superb maps and graphics, will love MacUSA. Provides you with an instant profile of each state that includes: city locations, elevations and natural features; demographic, economic, political, climate and health data; state history, tourist attractions, and time zones; state flags and entire state songs; simple print and export capabilities. For students, travelers, business people, and those who just want to know more about the United States. MacPlus or later model computers with System 6.0.4 or later. Publisher: PG Globe GRA0246

\$39

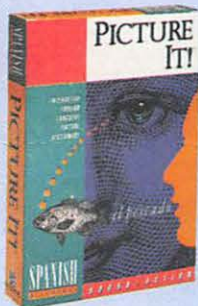


Accountant, Inc. 3.0.1

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\$335



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NEW ExpertColor Paint™

ExpertColor Paint is a simple to use yet powerful color paint program with many extras including 32-bit color, image editing and multiple undo's. By using a vast array of painting tools, you can create great looking art. You won't believe how easy the customizable tools make painting. There are multiple adjustable paint brushes, spray paint, paint cans and more to help create sophisticated art or touch up existing pictures. It's like having a fully equipped art studio at your disposal. Offers advanced image editing features like blur and sharpening filters and includes a free bonus clip art disk (\$24.95 value). Publisher: Softsync, Inc. GRA0318



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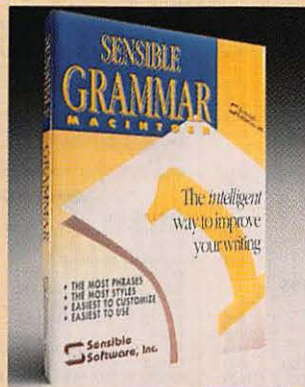


MacPrint 1.3

Use a Macintosh with non-Apple printers. Print Mac applications on HP Laserjet, Deskjet or compatible printers including all Series IIs, IIsx and the Deskjet 500. Prints text and graphics at the printer's maximum resolution.

Does not require PostScript. Cable is included. **Publisher: Insight Development**
UT10098

\$95



Sensible Grammar 2.1

Would you use a writing checker if it were built in? Sensible Grammar 2.1 makes good writing easier than ever before. Includes a unique Control Panel that adds a Grammar menu to your writing programs (like a spelling checker) when using Multifinder or System 7. To check a selection, highlight the text to be checked and choose Check Grammar. It automatically runs, checks the selection, returns to the writing program, and pastes in the corrected text. Alerts you to more complex problems, such as unclear sentences, squinting modifiers, and dangling elliptical phrases. It flags objectionable usage (sexist, racist, colloquial), and vague expressions. In addition, Sensible Grammar works with most popular word processors, including Word, WordPerfect, WriteNow, MacWrite, MacWrite II, and MS Works, Write, PageMaker 4.2 and text files.

Publisher:
Sensible Software
SPL0018

\$55

FontBank PostScript Display Typefaces

The FontBank PostScript Display typefaces give you a library of 250 type1 PostScript display typefaces. Build a versatile type library with designs ranging from the simple sans serif to the extreme ultra serif. Use them to create attention-getting headlines, sub-headings, titles, logos and special text effects. Included in the package are traditional, decorative, novelty, script, brush and calligraphic faces. Use these faces as a counterpoint to regular text or with design programs. With FontBank fonts, you get full-featured screen and printer fonts at an affordable price.

Publisher: FontBank
FON0438

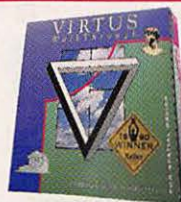


\$95

Virtus WalkThrough 1.11

The latest version of this award winning 3-D drawing program provides everything you need to quickly capture and explore your ideas in 3-D. Multiple windows and extensive drawing aids provide an interactive environment for editing and viewing your ideas. Interactive 3-D presentations, QuickTime® and PICS animated movies and perspective pictures dazzle your audiences. Enhanced Imports of 3-D DXF, PICT, Claris®CAD and MacDraw; and Exports of 3-D DXF, 2-D DXF, Claris®CAD, MacDraw, PICT and EPS. Winner of Mac/ser Breakthrough Product of the Year Award 1990.

Publisher:
Virtus Corporation
GRA0278

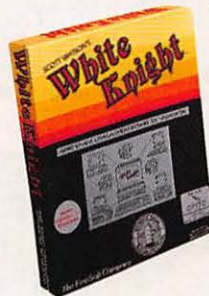


\$309

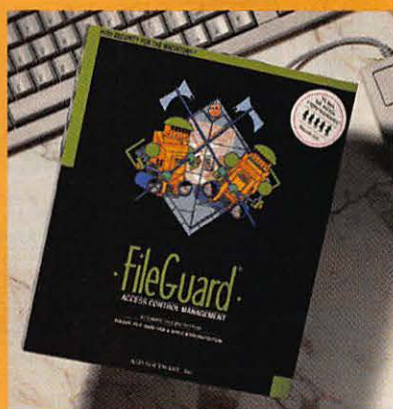
White Knight V.11

The perfect low-cost solution to almost any Mac telecommunicator's needs. Offers the kind of power associated with products costing hundreds of dollars more, but is easier to learn and more flexible. 270+ page user manual is geared to all levels of experience. Winner of 11 awards including MacWorld's World Class Software Award 1987-1991.

Publisher: FreeSoft
COM0060



\$85



FileGuard



"It's about as much software-based security as you can get in one package." MacUser, March 1992. Protect your hard drive from unauthorized access (including security bypass with a system diskette), copying and erasure; applications and file/folders (including System folder) from unauthorized access, deletion, and/or illegal copying; desktop from alterations by unauthorized users. Keep an eye on System usage with FileGuard's Users Log which continuously tracks user/group activity. For each protected file, FileGuard keeps a complete log of all operations performed, including creator & owner name, date/time of creation, total use time, attempts at unauthorized access and much more. System 7.0 Compatible. **Publisher: ASD Software Office 5-Pack**
UT10130 \$479. Office 10-Pack UT10131 \$799.
Single UT10135

\$139



Design Your Own Home:

Design Your Own Home: Architecture, Interiors, or Landscape. Create floor plans, elevations and building plans with structural details that you can hand right to your contractor. Do individual room plans and kitchen/bath designs. Then complete your dream house with graphic landscape plans. Interiors and landscape programs generate 4 side views from top-view perspective. Sample plans are included.

Publisher:
Abracadada

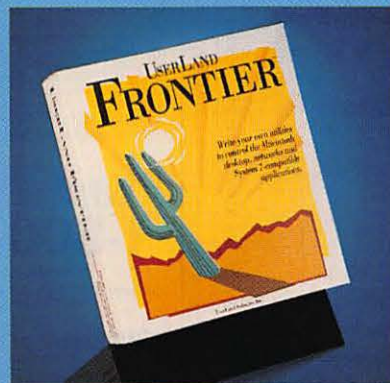
\$65ea.

ExpertWriter

ExpertWriter lets you create letters, faxes, memos—all your written communications—quickly, efficiently and professionally. With ExpertWriter, you can create a letter—from start to finish—in record time. Type your letter onto your actual letterhead, right on to the screen! Select an address, and it's inserted into the letter, with the salutation, automatically. You can print your letter, with a matching envelope, perfectly formatted with your return address, addressee and postal barcodes. Use your custom designed stationery or existing letterhead. Print labels, too! Also includes a built-in 93,000 word spell checker. ExpertWriter does everything in one stop—except hand it to the mailman!

Publisher: Softsync WRD0057

\$29



UserLand Frontier

With UserLand Frontier, you don't have to choose between pretty icons and the power to customize and automate your Macintosh. For the first time, you can have power and ease-of-use. Frontier is the first scripting software that allows you to write your own desktop utilities to customize, automate and simplify the Macintosh. Finally, there's an easy way to write scripts to manage networks and System 7-compatible applications. Frontier has all the development tools you need to get your scripts running quickly, including a full script debugger and structured symbol tables you can watch and edit while your scripts are running. When you're done, you can link scripts into Frontier's editable menu bar, or save them to the Finder desktop.

Publisher: UserLand Software UT10272

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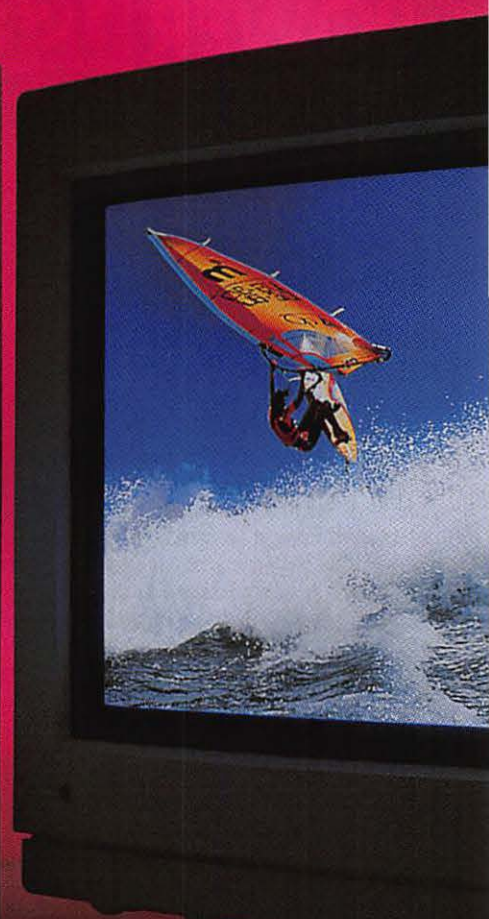
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The Quadra 950

APPLE ACCELERATES

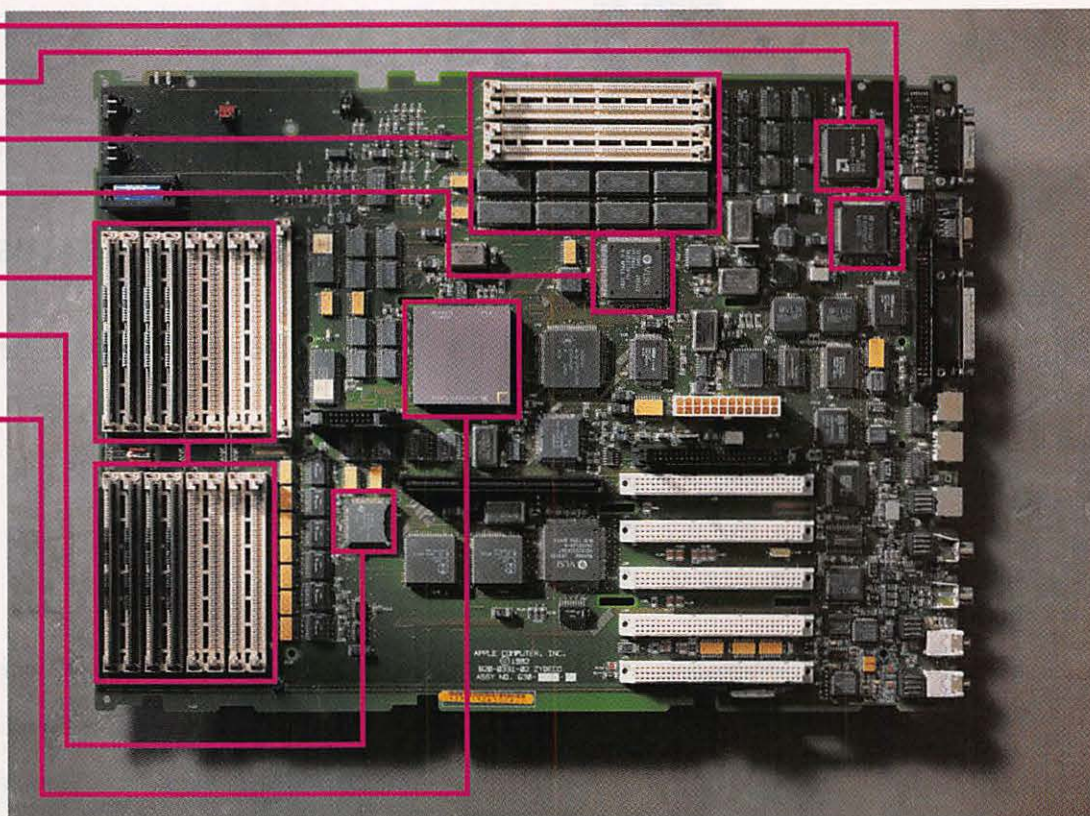
THE QUADRA 900 AND GIVES IT
A NEW NAME

BY LON POOLE

Seven whole months have passed since Apple introduced the Macintosh Quadra 900, and you've probably lain awake nights wondering when Apple would bring it up-to-date. Lose sleep no more, the Macintosh Quadra 950 is here. The new machine looks like the old one but provides almost a 30 percent performance improvement over the original Quadra 900. The increased performance comes from a faster version of the Motorola 68040

microprocessor and to a lesser extent from speeding up the computer's interaction with peripheral devices. ⚙ The Quadra 950's built-in video works with 19-inch color monitors and can display thousands of colors (16-bit color) on all sizes of color monitors. Apple's factory installs 8MB of RAM in all Quadra 950s sold in North America, South America, and the Pacific Rim (in some European countries 4MB is installed). And a high-performance 230MB hard drive supersedes the 160MB drive as the smallest internal hard drive Apple bundles with a Quadra worldwide. (A floppy-only configuration is still available.) The Mac Quadra 700 also gets the 230MB hard drive upgrade but otherwise hasn't changed. Best of all, the Quadra 950 is priced the same as the 900 (but you get

1. Ethernet controller
2. video output DAC
3. Video RAM
4. video controller
5. 8MB RAM
6. main memory controller
7. 33MHz 68040



What's New on the Quadra 950's Logic Board? The Quadra 950 retains the 900's logic board layout, but the new board has some higher-performance silicon. All the parts of the system that connect to the faster system bus operate at a faster speed, and several chips were replaced with faster versions, including (1) the Ethernet controller; (2) the video output DAC (Digital-to-Analog Converter); (3) Video RAM; (4) the video controller; (6) the main memory controller; and (7) a 33MHz 68040. And 8MB of RAM (5) is now the standard configuration on most Quadra 950s.

more for your money): \$7199 for the floppy-drive-only model, \$8499 with a 230MB internal hard drive, and \$9199 with a 400MB hard drive.

If you already have a Quadra 900, an Apple dealer will be able to upgrade it to a 950, but at press time, pricing for this upgrade was not yet set. Apple planned to have adequate supplies of the Quadra 950 in dealers' inventories by May 18, while upgrades should be available in mid-June.

Infrastructure

ALL THE QUADRA 950'S IMPROVEMENTS ARE BE-
neath its skin. The new machine retains its predecessor's upright cabinet, three-position key lock (off, on, and secure), disk drive placement, and back panel. On the back panel are ten ports—SCSI, video, ADB (Apple Desktop Bus), Ethernet, modem, printer or LocalTalk, and four sound ports—as shown in "Out Back on the 950." The back panel also has electrical connections and spaces for the connectors of five internal expansion boards.

Inside, the 950 has four disk-drive compartments at the top. Two face the front for the installation of 5¼-inch, half-height (or smaller) storage devices with removable media such as floppy disks, CD ROMs, and magneto-optical drives. You can use the two rear-facing compartments together to install one full-height device or two half-height devices. The 950 comes with a standard SuperDrive for floppy disks in the top front compartment. Apple fills one of the

950's rear compartments with a 230MB hard drive (currently made by Quantum), a 400MB hard drive (made by Seagate), or no hard drive. Macworld Lab tests found that the 230MB drive completed the test suite in about 50 percent of the time it took the 160MB drive (1MB mechanism) in the Quadra 900 used for testing.

Beneath the hard drive compartments sits a massive power supply held over from the Quadra 900. This power supply puts out 300 watts of internal power, enough for a full load of internal storage and expansion boards. The power supply configures itself to the local electricity almost anywhere in the world—100 to 240 volts, 50Hz to 60Hz AC.

Logic Board

THE POWER SUPPLY, INTERNAL STORAGE DEVICES, and back-panel ports all connect to the logic board. The Quadra 950 retains the 900's logic board layout, but the new board has some higher-performance silicon. The 68040 microprocessor and the system bus that connects directly to the 68040 run at 33MHz, 32 percent faster than the Quadra 900's 25MHz 68040 and system bus. Consequently, all parts of the system that connect to the system bus operate at the faster speed. They include main memory, built-in video, the NuBus controller, the SCSI controllers, and the Processor Direct Slot (PDS).

Along with accelerating the system bus, Apple also raised the I/O (input/output) bus from 16MHz

to 25MHz. As a result, the 68040 can transfer information more quickly to the relatively slow devices connected to the I/O bus, freeing the 68040 for other work and improving overall system performance. The I/O bus handles communication and data transfer with the floppy disk drive and with devices and services connected to the ADB port, sound ports, Ethernet port, and serial ports (including LocalTalk). Accelerating the I/O bus does not speed up many of these devices and services themselves because most of

played on the CD ROM drive without having to purchase additional external speakers.

Built-In Video

LIKE ALL OTHER MACINTOSH MODELS, THE Quadra 950 relies on its microprocessor to draw every pixel on its monitor. The 950 has no graphics coprocessor dedicated to drawing the screen image, nor does it have an I/O coprocessor dedicated to hustling screen images from main memory to video memory.

The Quadra 950 is priced the same as the 900, so you get more for your money

them operate at speeds well below the I/O bus speed. Don't expect a faster SuperDrive, StyleWriter, TelePort ADB modem, keyboard, or mouse. Apple does claim Ethernet can get 20 percent to 30 percent faster throughput on the Quadra 950 than on the Quadra 900 under optimum, but rather unlikely, conditions (transferring files from a RAM disk file server). And in theory, while using digital telephone services such as ISDN (see "Digital Data on Demand," *Macworld*, February 1992), the Quadra 950 could sustain higher data-transfer rates through the modem port than could other Macs.

Two coprocessors carried over from the Quadra 900 further lighten the 68040's load by taking care of low-level communications with the ADB port, the floppy disk drive, and the serial ports (including LocalTalk networking). Each IOP (Input/Output Processor) is actually a computer with the power of an Apple II on a chip. The IOPs smooth system performance, so, for instance, you experience less mouse jerkiness during floppy disk activity and fewer system slowdowns caused by LocalTalk activity such as printing in the background or someone accessing the hard drive with System 7 file sharing. Only the Quadra 950, Quadra 900, and Mac IIfx have IOPs; the Quadra 700 does not.

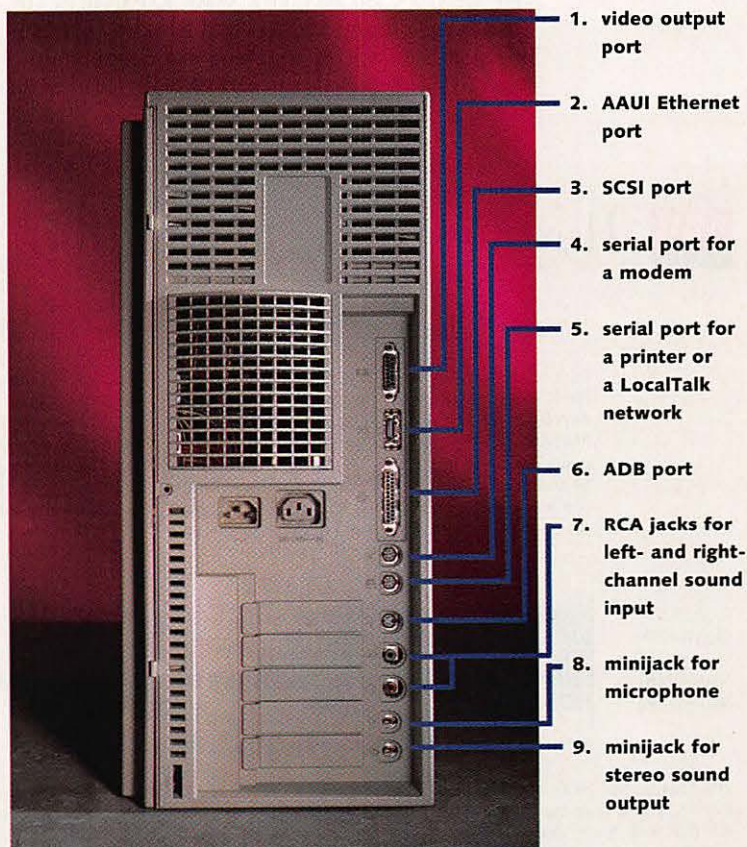
Despite the faster system and I/O bus, Apple had to replace only a few chips with faster versions for the Quadra 950's main logic board. They include the main memory controller, video memory, and Ethernet controller. Other chip changes—video controller, video output DAC (Digital-to-Analog Converter), and ROM—provide new video capabilities. Other ROM changes fix two minor bugs. One of the bugs caused obscure rounding errors in floating-point calculations at the 15th digit; the other prevented Ethernet from working properly with more than 16 buffers (8 is the standard number of buffers).

The Quadra 950 uses the same 80-nanosecond RAM SIMMs as do the Quadra 700, Quadra 900, and Mac IIfx. The 950's logic board has 16 SIMM sockets, which you can populate with sets of four 1MB or 4MB SIMMs to get up to 64MB of RAM.

Sound capabilities remain unchanged. Circuitry on the logic board mixes a monophonic signal from sound input through the stereo microphone minijack or through the left- and right-channel line inputs. The 950 plays blended stereo sound through its single internal amplified speaker or stereo sound through a minijack. If you install an internal CD ROM drive, you can connect it internally to the stereo output minijack so you can hear audio CDs

Apple claims that built-in video is 25 to 32 percent faster on a Quadra 950 than on a Quadra 900.

The 950's faster 68040 speeds up video by more quickly processing all instructions, including those related to displaying the screen image, and by more quickly accessing video memory, called VRAM (Video RAM). This faster accessing means the 950 requires faster VRAM—80ns or faster, compared with 100ns or faster on a Quadra 700 or 900. The 950 has 1MB of VRAM soldered onto the logic board, plus SIMM sockets for adding another 1MB.



Out Back on the 950 There are ten connectors along the side of the Quadra 950's back panel. Near the bottom are covered openings, for the connectors of five expansion boards. Above these openings are electrical power connectors.

With a full 2MB of VRAM installed, the 950's built-in video gives you a new choice for the number of colors in the Monitors control panel—Thousands (16 bits per pixel). You can set this new color depth on any color monitor that works with the 950, including Apple's 12-, 13-, 16-, and 21-inch color monitors and monitors compatible with them. With 2MB of VRAM you can also set the 12-, 13-, and 16-inch color monitors for millions of colors (24 bits per pixel), as you can on a Quadra 700 or 900. The 16-bit color depth comes close to the photo-realism of 24-bit color but displays more quickly, a strong benefit when viewing QuickTime movies. With 1MB of VRAM, you can display up to 256 colors or shades of gray on any monitor that works with the 950.

Besides the monitors already mentioned, the Quadra 950's built-in video works with 19-inch color monitors that support a 75Hz vertical, 60kHz horizontal refresh rate. (Because Apple offers no 19-inch monitor, there is no Apple standard at this size.) All other Macs, including the Quadra 700 and 900, require a video adapter for 19-inch monitors. Three Apple monochrome displays—the 12-inch, the 15-inch full-page, and the 21-inch—also work with the 950's built-in video. So do some VGA and XGA monitors made for DOS PCs. With an external adapter you can connect an NTSC or PAL television monitor, a video recorder, or other TV equipment to the video port.

Expansion

THE QUADRA 950 HAS THE SAME EXPANSION OPTIONS as the Quadra 900—two SCSI ports, five NuBus slots, and a PDS slot. You can connect up to seven SCSI devices to the pair of high-speed SCSI

ports, one internal and the other external. Each of these ports has its own high-speed SCSI controller chip (the NCR 53C96) on the logic board. Having separate controllers isolates internal SCSI devices from the performance-sapping effects of long external cable runs and slow external devices such as scanners. Apple claims that on the Quadra 900, the 53C96 SCSI controllers can achieve data-transfer rates of 4MB per second. Theoretically the 950 can transfer data at more than 5MB per second, exceeding the throughput of all but the fastest hard drives you can buy today. Moreover, all Quadras including the 950 could attain even higher data-transfer rates if Apple would revise the SCSI Manager part of the system software to take advantage of the new SCSI-2 standard (for more on SCSI, see *Getting Started*, May 1992). By modifying the SCSI Manager, Apple could also allow up to 14 SCSI devices to connect to the 950's dual SCSI ports.

You can add five expansion boards to the Quadra 950's logic board, which has five NuBus slots and one PDS slot. One NuBus slot lines up with the PDS slot; you can use one or the other but not both. The PDS slot connects directly to the system bus and therefore presents a potential compatibility problem. PDS boards made for the 25MHz system bus in the Quadra 700 and 900 could experience timing problems with the 33MHz system bus in the Quadra 950, although these hadn't surfaced by press time.

The 950's system bus speed poses no compatibility problem for NuBus boards, which operate on a separate synchronous bus whose speed the NuBus standard pegs at 10MHz regardless of the host Mac's asynchronous system bus speed. The NuBus slots all connect to the system bus indirectly through control-



How Fast Is a Quadra 950?

Screen Redraw

Four scroll tests—in Claris Resolve, Microsoft Excel, Microsoft Word, and MacWrite II—represent overall graphics-handling performance, since scrolling is the Mac's most common graphics task.

FPU Math

Five tests—function evaluation in Mathematica, scientific simulation in Extend, rendering in Infini-D, and scientific recalculations in Excel and Resolve—show a floating-point-unit math processor's performance.

Non-FPU Math

Two tests—business recalculations in Excel and Resolve—show the performance of math functions by the processor and Standard Apple Numerics Environment (SANE).

Processor

Five tests—a sort in FileMaker II, a graphics flip in MacDraw Pro, a preview in Aldus FreeHand, and replaces in MacWrite II and Word—measure the speed of the processor by itself.

Drive

Four drive-intensive tests—a sort in 4D, opening files in PageMaker and Photoshop, and a Think C compile—measure the CPU's processing speed as well as its ability to transfer data to and from the Quantum LPS hard drive.

	Screen Redraw	FPU Math	Non-FPU Math	Processor	Drive
Quadra 950	120.9	144.3	4.5	39.6	198.6
Quadra 900	151.9	184.8	5.8	49.6	208.9
Quadra 700	156.6	184.8	5.7	50.4	208.0
Mac IIci (A)	265.2	358.3	13.9	90.7	283.8
Mac IIci (B)	187.0	147.5	4.7	35.0	211.8

Times are in total seconds for each set of tests. Shorter bars are better.

The Quadra 950, 900, and 700 were all tested with 8MB of RAM, 2MB of VRAM, and a Quantum LPS 230MB hard drive. To see how a Macintosh IIci that had been upgraded with several of the Quadra's key features would compare with the Quadra 950, we tested a IIci (a 68030 machine) with 8MB of RAM, an Apple Cache Card, an E-Machines ColorLink SX/T Interface Card (which provides 24-bit accelerated graphics and 10BaseT Ethernet capabilities), and a Quantum LPS 230 (A). This upgraded machine

was much slower in all of the tests than even the Quadra 700. We then added a Radius Rocket 33 accelerator board, which has a 68040 CPU running at 33MHz, and found that this souped-up IIci (B) nearly matched the Quadra 950 in four out of five tests, although the total cost of this system (\$8142) is close to the cost of buying a Quadra 950 (\$8499) and would still lack several key Quadra features, such as a hearty power supply and extra slots for internal devices.

ler and transceiver chips on the logic board. Because the NuBus controller runs at the 950's increased system bus speed, NuBus boards do have faster access to the 68040, RAM, and VRAM memory on the 950 than on the 900. The 950 inherits the 900's partial implementation of the nascent NuBus-90 specification, including the ability to run specially designed NuBus boards at 20MHz, but no one has yet developed boards that take advantage of the NuBus-90 capabilities. The Quadra 950 continues the two other

money. For example, an accelerated IIci—with 8MB of RAM, a fast 230MB hard drive, an E-Machines ColorLink SX/T video accelerator with an Ethernet port, and a Radius Rocket 33—kept pace with a Quadra 950 in virtually all Macworld Lab tests (see "How Fast Is a Quadra 950?"). Yet this upgrade package lists for about \$3600 (street prices) less than a Quadra 950. (For a complete discussion of accelerator options, see "The Need for Speed," June 1992.)

What the lab tests don't tell you is how much

If you already have a Quadra 900,

extensions to Apple's NuBus convention begun by the Quadra 900. Two NuBus slots have extra electrical power, 25w instead of the usual 15w. All five NuBus slots have room for boards 2 inches taller than normal, offering developers room to add expanded capabilities.

Software and Compatibility

NONE OF THE QUADRA 950'S IMPROVEMENTS REQUIRE a new version of system software. Like the Quadra 700 and 900, the 950 comes with System 7.0.1 and will not work with an earlier version. You can also run A/UX 3.0 on the 950.

The 950 also comes with Cache Control, Apple's control panel for making a Quadra compatible with software that trips over the 68040's copy-back cache (explained in "The Quadra Quandary," March 1992). Apple is convinced the 68040 cache problem will go away as developers upgrade application programs, and developers have been busy the past seven months proving Apple mostly right. Still, there will always be incompatible programs that people will want to use with a Quadra. Two companies offer more-sophisticated control panels than Apple's Cache Control for those who need to run an application that isn't compatible with the copy-back cache.

Whereas Cache Control insists you restart the Quadra to turn off the 68040's cache (concomitantly reducing the Quadra's performance to the level of a IIci), the Animals control panel from Impulse Technology and the Quadra Compatibility INIT 3.0 from Alysis Software Corporation let you change the cache setting on the fly for those times when you want to use a non-68040-compatible application without restarting. Animals even lets you designate an alternate 68040 cache setting, write-through, that Impulse claims can complete a representative test suite in 33 percent of the time it would take to do it with no caching (that is, three times as fast), yet causes fewer compatibility problems than copy-back caching does. Both Impulse and Alysis insist they have solved the floppy-disk-timing and AppleTalk problems that Apple cites as its reasons for not allowing on-the-fly cache changes in Cache Control.

Value

WITHOUT QUESTION THE QUADRA 950 IS THE fastest, most flexible Mac you can buy. If you already own one of the Mac II models and want more speed, should you trade up? Perhaps not, considering you can accelerate a Mac II-family machine's performance to almost equal that of a Quadra 950 for less

paying for the 950 upgrade will hurt

faster a Quadra 950 (or any Quadra) can be if you couple it with a hard drive that can sustain data transfer at 4MB to 5MB per second. That rate is much faster than the SCSI transfer rate of the 230MB and 400MB drives that Apple currently stuffs into Quadras (about 2MB per second); it's also faster than the transfer rate of any type of Mac II (about 1.6MB per second). Remember that the Quadra 950 has other speed advantages—mostly theoretical right now—including SCSI-2 capability, partial NuBus 90 implementation, and a 25MHz I/O bus. An accelerated Mac II also lacks the Quadra 950's bigger power supply, its taller NuBus slots, and its four compartments for internal storage devices. None of these advantages show up in the lab tests.

If you have been planning to buy a Quadra 900, the 950's extra performance, memory, video capabilities, and hard drive space and performance at no extra cost will be welcome surprises. If you already have a Quadra 900—ouch! Paying for the 950 upgrade will hurt. When deciding whether to upgrade, estimate how much time you wait while your Quadra 900 displays, calculates, or does other work, and multiply that estimate by 30 percent to approximate how much time the 950 upgrade will save you. Then divide the upgrade cost (which Apple hadn't decided at press time) by the value of that saved time to calculate how quickly the upgrade will pay for itself. If your 900 doesn't keep you waiting now, pretend the 950 upgrade doesn't exist and save your upgrade money until a faster upgrade option comes along.

The improvements Apple has made in the Quadra 950 keep the top-of-the-line Macintosh competitive with computers from other manufacturers. Although its motives weren't altruistic, Apple deserves credit for giving its customers quick access to increased performance made possible by very recent advances in microprocessor technology. **m**

See *Where to Buy* for contact information.

Contributing editor LON POOLE sleeps much better now that Apple has finally upgraded the Quadra 900 to the 950, but he still dreams about owning one. You can help by buying his books, *Amazing Mac Facts* (Microsoft Press, 1991) and *Macworld Guide to System 7* (IDG Books Worldwide, 1991).

Macworld Lab testing supervised by MARK HURLLOW.

When Word Aren't Enough

Imagine this.

corporation with the most exciting product on the market. You control. Every slide is in position, every desk has a handout. You explain a few ideas on the fly. But something's not working, your restless. ■ Where did you go wrong? The problem isn't with you are presenting.

First image, click click, second image, click click . . . Twenty years of computer technology and thousands of dollars at your disposal, and the best you can come up with is the same old kind of slide show I remember falling asleep to in the second grade. The only thing missing is the beep.

But as you speak, new technology is changing the presentation market, offering animation, interactivity, and QuickTime. These elements introduce movement into the old slide-show formula. Granted, some of this technology is still in the rough. But with a little effort, and a whole lot of storage space, you can create dazzling effects guaranteed to entertain as you educate.

Creating Static Presentations

ALMOST SINCE ITS INCEPTION, THE Macintosh presentation market has largely consisted of the three Ps: Microsoft PowerPoint, CA-Cricket Presents, and Aldus Persuasion. All three programs allow you to print slides and overhead

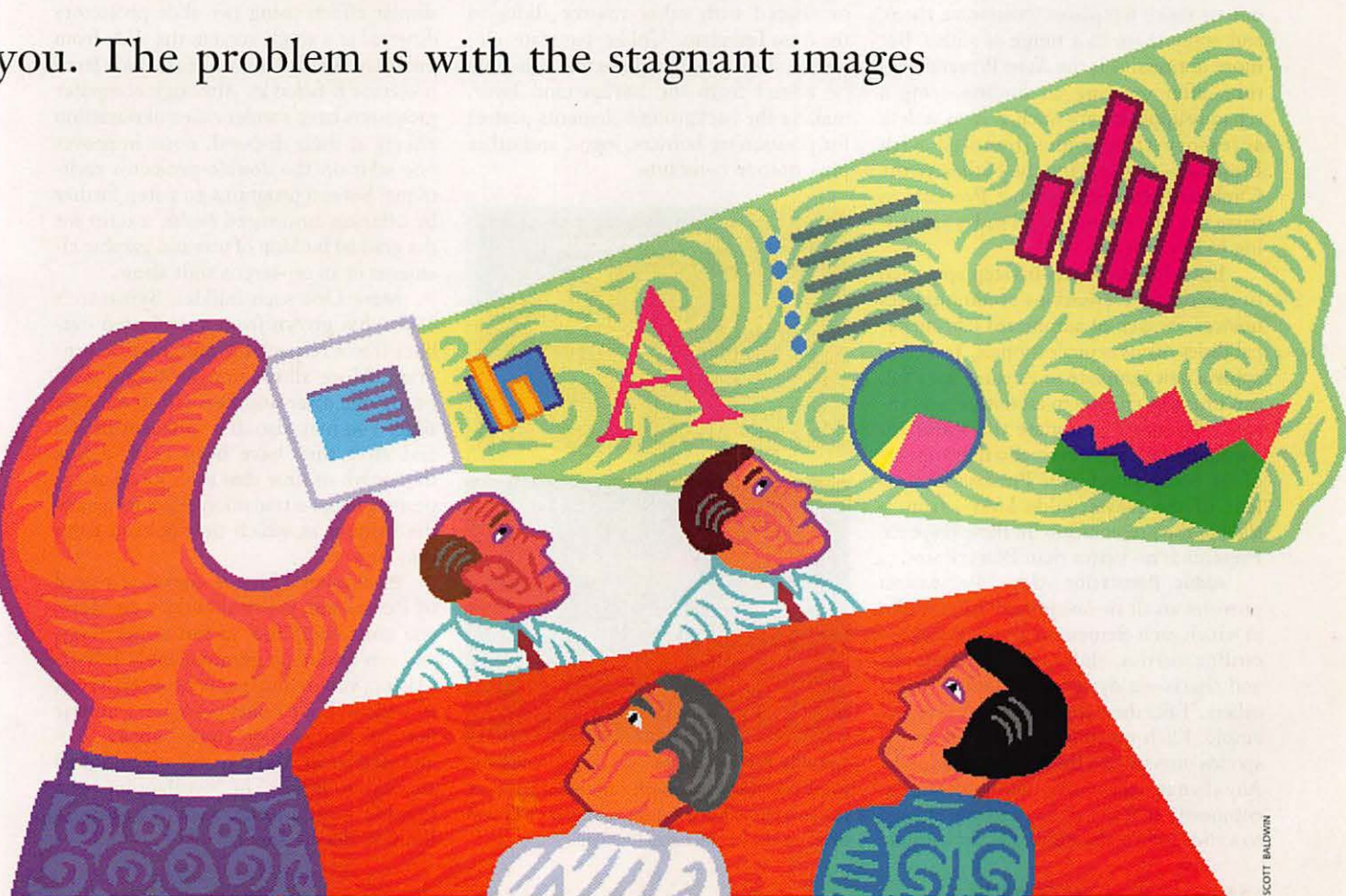
projections, generate speaker's notes that you can use to guide your presentation, and organize slides into handouts that audience members can take home with them and study at their leisure. Slides or overheads, speaker's notes, and handouts make up the cornerstones of the traditional presentation formula. But the formula, and the programs that subscribe to it, is showing signs of age. In fact, in the two years since we last looked in on the presentation arena ("Here's the Pitch," *Macworld*, March 1990), only Persuasion has made any discernible improvements. But new products have entered the market to challenge these packages: Vividus's Cinemation, InfoTouch Marketing Corporation's InfoLynx, Macromedia's Magic, and Meyer Software's On The Air, while Symantec Corporation's More has evolved into a formidable competitor.

PowerPoint Microsoft PowerPoint is especially antiquated, providing no more than a bare-bones environment for combining text and graphics. A do-it-your-

**Eight
presentation
programs
put through
their paces**

BY DEKE McCLELLAND

SYou're a presenter representing a million-dollar company. Your slides are thoroughly organized, well groomed, and in perfect order. You've even rolled in a chalkboard in case you have to improvise. But if your presentation is falling flat, your audience seems bored, and you're alone. The problem is with the stagnant images



self philosophy pervades the program's environment to the extent that even its automated features, like the master-slide layer, require much busywork. Here's how it works. Elements placed on the master slide are duplicated throughout all slides in the presentation. However, of these elements, only the title can be modified from one slide to the next; all other master-slide elements are static. As a result, you have to create, position, and format text and graphics manually for each and every slide. Honestly, PowerPoint relies so heavily on the work ethic of the user that only a Puritan would find the program acceptable.

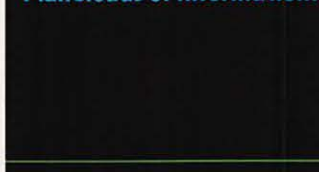
CA-Cricket Presents CA-Cricket Presents is slightly better than PowerPoint in offering automatic ways to do repetitive tasks. Most notably, it offers an ingenious built-in spreadsheet with charting capabilities that match those provided by Persuasion and More. Although Presents doesn't offer much room for creativity, it makes the creation of basic charts and tables straightforward and effortless. Upon your clicking or dragging with the graph tool, Presents walks you through the creation and formatting of spreadsheet data, axes labels, and markers.

Presents also automates the creation of entire presentations. You can import one or more templates, customize them, and apply them to a range of slides. But more impressive is the Auto Presents feature: after creating an outline using a separate application—such as Acta, a desk accessory that comes bundled with Presents—and copying the outline to the Clipboard, you can instruct Presents to paste the outline and build slides according to its contents.

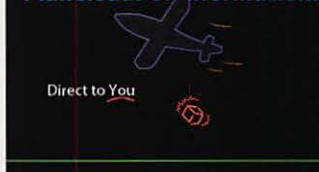
But while this step-by-step approach to creating presentations accommodates novices, its lack of automated editing capabilities dismays professionals. You can't apply a new template to existing text. You can't make a change to an outline and instruct Presents to update the slides accordingly. You can't even edit the contents of the background—the Presents equivalent of the master-slide layer—from a slide in the presentation. In these respects, Presents is no better than PowerPoint.

Aldus Persuasion Aldus Persuasion provides an all-in-one presentation studio in which each element of a presentation—outline entries, slides, notes, handouts, and charts—is dynamically linked to the others. Take the built-in outliner as an example. Each entry in the outline corresponds directly to a title or entry in a slide. Any change made to the outline affects the composition of the slides, and any change to a slide affects the entries in the outline.

Planeloads of Information!



Planeloads of Information!

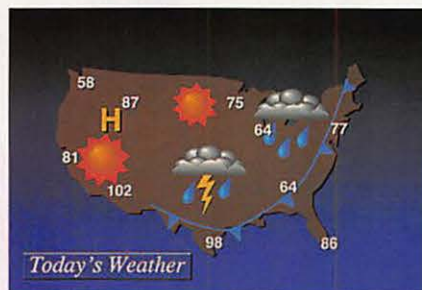
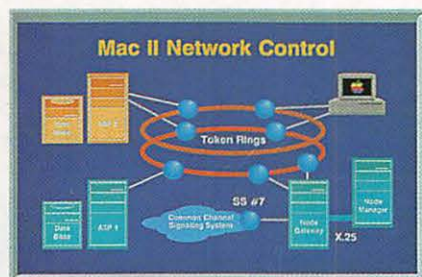


Planeloads of Information!



Creating a Build in Persuasion In Aldus Persuasion, you can create simplified animated effects by building up information on separate layers. When the slide first appears, you see only the contents of layer 1 (left). After a specified amount of time, Persuasion adds the contents of layer 2 to the slide (middle), subject to the desired transition effect. Finally, the contents of layer 3 appear (right).

Persuasion's AutoTemplates transcend the scope of templates associated with most other applications, presentation or otherwise. When you import an AutoTemplate, you actually import several complementary templates at a time, all of which are made available in a pop-up menu at the bottom of the slide window. If you don't care for the appearance of the current slide, simply choose a different template option and Persuasion automatically reformats all text and graphics to fit the new layout. Each template serves as a separate master slide. But unlike PowerPoint and Presents, Persuasion lets you change the placement and formatting of text and graphics on the current slide if you do not like the way they were assigned by the template. Equally impressive, each master slide is equipped with a separate background that can be swapped or shared with other master slides in the AutoTemplate. Unlike template elements, background elements can only be edited from the background layer, making the background elements perfect for positioning borders, logos, and other presentation constants.



Graphic Presentations Showing is sometimes easier than telling. Microsoft PowerPoint was used to create the network diagram (top); More was used to create the weather map (bottom).

Adding Limited Motion

ALL OF THE FEATURES I HAVE DISCUSSED so far were designed specifically to accommodate the creation of static slides and overhead transparencies. If you want to add motion to your presentation, the computer screen is your medium of choice.

The most common screen effect is the transition. A transition dissolves the current slide into the next. One slide, for instance, may wipe over another, grow outward from the center of the screen, or fade out of view. Transition effects are widely popular. Of the programs covered in this article, only PowerPoint and InfoLynx lack transition options.

But despite their general acceptance, transition effects add little to a presentation. Since well before the advent of personal computers, presenters achieved similar effects using two slide projectors directed at a single screen: the slide from projector A faded out while the slide from projector B faded in. Although computer presenters have a wider range of transition effects at their disposal, none improves one whit on the double-projector technique. Several programs go a step further by offering automated *builds*, a term for the gradual buildup of text and graphic elements in an on-screen slide show.

More One such builder, Symantec's More, has grown from a dedicated outliner into a respectable presentation program. More allows you to display subheads one after another within a single slide. You may also dim subheads before and after they have been read, define the length of time that each subhead appears, and use a transition effect to specify the manner in which the subhead fades into view.

Persuasion More is outmaneuvered by Persuasion, the rival builder. In More, you must build lines of text sequentially; you can't build up graphics at all. In Persuasion, you define builds by using layers, in which all elements on layer 1 appear first, all elements on layer 2 appear second, and so on. You can even create stilted animation effects by overlapping one graphic onto another (see "Creating a Build in Persuasion").

Adding Animation

IF YOU HAVE SOMETHING MORE SPIRITED in mind, then you may want to forgo the traditional crowd in favor of the recent crop of presenters with animation capabilities. On The Air and Cinemation both offer easy-to-use animation and the ability to upgrade existing presentations. Magic provides straightforward animation capabilities but cannot import presentations from other programs. None of these programs provide a built-in outliner or an automated charting function. And all three offer shamefully deficient text-handling capabilities—no leading control, no manual kerning. But each simplifies the animation process so skillfully that you'll soon find yourself propelling type and graphics with the greatest of ease.

On The Air On The Air emulates the slide metaphor employed by Persuasion and the other traditional presenters. Within each slide, you can create and import text and graphics. You may then specify the direction in which each element moves by drawing a path with one of the line tools. A dialog box lets you

rotate and flip an element as it moves across the screen. You can also specify the moment at which an element debuts in a slide, when it disappears, and how quickly it moves. If you like, you can highlight each movement by adding pre-recorded sounds.

On The Air imports the contents of the Scrapbook, so it's perfect for adding animated effects to presentations created in PowerPoint, Persuasion, or Presents (all of which export to the Scrapbook). On The Air also comes with a run-time player utility in case you want to distribute your animated presentations on disk. Although I met with some minor bugs when using the program—it wouldn't run properly when using my IICI cache card, for example—and the manual cries out for an index, On The Air provides a tidy collection of options for only \$175.

Magic If you're looking for something with a wider range of animation capabilities, Magic may better meet your needs. Magic organizes text and graphics into scenes, which are analogous to the slide metaphor used in the traditional presen-

tation programs. All animation effects take place within scenes by moving objects, called actors. In addition to a wide array of drawing tools, Magic is the only program except More to provide Bézier-type curve editing. By contrast, On The Air has only rudimentary tools. Also, Magic is alone in allowing you to reshape basic objects, like rectangles and ellipses. To define the appearance of an object, you may fill it with a flat color or, uniquely, with an imported PICT image. To an extent, this helps to offset Magic's inability to create gradations, since you can make a gradation in a color paint program, save it as a PICT file, and then insert it into a Magic object.

As in On The Air, Magic lets you animate a sequence by drawing paths of movement. By default, an object begins moving slowly, accelerates into the middle of the move, and decelerates as it comes to a stop, which affords the move a gradual, natural appearance. But if you prefer, you may use Magic's Cue palette to make an object move at a constant speed. You may also assign transition ef-

Presentation Alternatives

Most of the programs discussed below already have a steady day job, but they moonlight as presenters, with varying degrees of success.

The first of these are the draw programs MacDraw Pro 1.0v1 and Canvas 3.0 (\$399 apiece). In both programs, you can convert a drawing so that each layer becomes its own slide. You may then set how long each slide displays and play them in order. That's the extent of Canvas's capabilities. MacDraw Pro goes a little further. You can assign the first layer as the master slide so that it appears in the background behind all the others. You can also print multiple slides per handout. But you can't document the handouts or create speaker's notes. And neither program provides charting functions, outline capabilities, or even transition effects, making them poor solutions for anyone who creates presentations on a regular basis.

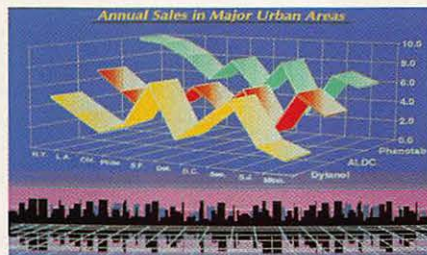
If you find yourself presenting numbers more often than textual information, you may want to turn your attention away from dedicated presentation programs in favor of dedicated graphing programs, including GraphMaster

(\$295), KaleidaGraph (\$249), and DeltaGraph Professional (\$295). All three offer enough charting features to put a spreadsheet alternative like Microsoft Excel or Wingz to shame, and all three let you output high-quality color slides. GraphMaster provides a custom template option that can be used to design handouts and speaker's notes. KaleidaGraph facilitates the creation of common slide types by automatically generating a macro that describes an existing chart so that you can apply that same look to new data. But so far as graphing presenters are concerned, DeltaGraph Professional is the clear winner.

Of the three graph programs, DeltaGraph is the only one capable of generating true three-dimensional charts with x, y, and z axes. If that's not enough, DeltaGraph offers transition effects, a built-in spelling checker, a slide sorter, and QuickTime support, all of which are missing from GraphMaster and KaleidaGraph. In fact, if you are a scientist first and a presenter second, I recommend DeltaGraph over any other program covered in this article.

The third group of presenta-

tion alternatives includes what I will call, for lack of a better term, the HyperCard solutions. Presentation Passport from Computer Solutions enables the busy presenter to track and catalog information about presentations conducted



3-D Trends This three-dimensional ribbon chart was created with DeltaGraph Professional to portray market trends in major urban areas.

using other software. This simple little HyperCard stack (\$89.95) lets you enter specific data—such as the presentation title, date, location, length, and audience size—then later search or browse through this data when creating new presentations.

If you have in mind something that will actually generate presentations, then you might want to examine HyperKit Emcee created by Ronald R. Reed (\$195

from Digital Concepts, \$125 if purchased directly from the author). Designed specifically for creating on-screen slide shows, this fantastic little product will meet the needs of most users equipped with a compact Mac. In

HyperKit Emcee, you can import a tab-delineated ASCII outline, select default transition effects, and automatically generate a fully functioning HyperCard stack.

You navigate the stack by clicking on buttons associated with outline titles and entries. With very little effort, you can even link a button to a menu command or an external document, making Emcee an ideal tool for creating product demonstrations. Best of all, the program's design is so straightforward, it took me less than 30 minutes to get up and running. Though it lacks color and animation features, HyperKit Emcee warrants serious consideration from the presenter on a budget.

PRESENTING THE PRESENTERS

	Aldus Persuasion 2.1	CA-Cricket Presents 2.1	Cinematic 1.0	InfoLynx 1.0	Magic 1.0	Microsoft PowerPoint 2.01f	More 3.1	On The Air 1.0
GENERAL								
Company	Aldus Corporation	Computer Associates	Vividus	InfoTouch Marketing Corporation	Macromedia	Microsoft Corporation	Symantec Corporation	Meyer Software
List price	\$495	\$199	\$495	\$295	\$395	\$395	\$395	\$175
Minimum system	Mac Plus, 2MB	Mac Plus, 1MB	Mac Plus, 1MB	Mac 512KE, 512K	Mac SE, 2MB	Mac Plus, 1MB	Mac Plus, 1MB	Mac II, 2MB
Bundled utilities	none	Acta ¹	none	none	QuickPICS ²	SmartScrap ³	none	none
Automated templates	●	●	●	○	○	○	○	○
Run-time player	●	○	● ⁴	not needed ⁵	●	○	○	●
Service bureau drivers	none	Autographix	none	none	none	Genigraphix	Autographix	none
Built-in outliner	●	○	○	○	○	○	●	○
Prints speaker's notes and handouts	●	●	○	○	○	●	●	○
Slide sorter	●	●	●	●	●	●	○	●
Number of view sizes	6	9	2	1	2	4	6	1
Master-slide option	●	●	○	●	○	●	●	○
Supports Events Manager and IAC	●	○	○	○	○	○	○	○
Help (on-line/balloon)	●/○	●/○	○/○	○/○	○/○	●/○	●/●	○/○
TEXT HANDLING								
Spacing (leading/paragraph)	●/●	●/●	○/○	●/○	○/○	●/●	●/●	○/○
Manual kerning	○	●	○	○	○	○	○	○
Tab stops	●	●	○	○	○	● ⁶	●	○
Style sheets	●	○	○	○	○	○	●	○
Spelling checker/thesaurus	●/○	●/●	○/○	○/○	○/○	●/○	●/○	○/○
Search and replace	●	○	○	○	○	●	●	○
Special text effects	shadow	shadow	compress, rotate	none	none	none	shadow, depth	rotate
GRAPHICS HANDLING								
Number of drawing tools	7	10	8	0	8	4	6	6
Align objects/group objects	●/●	●/●	○/○	○/○	●/○	○/○	●/●	●/●
Gradient backgrounds	●	●	●	○	○	●	●	○
Color capabilities	24-bit	24-bit	24-bit	24-bit	24-bit	24-bit	24-bit	8-bit
Clip art package included	3G Graphics	PicturePak	in-house	in-house	SwivelArt, ClipMedia	in-house	ClickArt	none
CHARTING CAPABILITIES								
Internal spreadsheet capabilities	●	●	○	○	○	○	separate utility	○
Number of chart types	10	8	0	0	0	0	9	0
3-D charts	●	●	○	○	○	○	●	○
Exploded pie chart slice	●	○	○	○	○	○	●	○
Organizational charts	●	○	○	○	○	○	●	○
ON-SCREEN PRESENTATIONS								
Number of transition effects	14	12	20	0	12	0	23	4
Dual monitor support	○	○	○	○	●	●	●	●
Automated builds in one frame	●	○	○	○	○	○	●	●
Animation capabilities	○	○	●	○	●	○	○	●
Sounds (record/import/play)	○/○/○	○/○/○	●/●/●	○/○ ⁷ /●	●/●/●	○/○/○	○/○/○	○/●/●
Interactive frame linking	○	○	●	●	●	○	○	○

● = yes; ○ = no. ¹ An outlining utility. ² A PICS compression and player utility. ³ A Scrapbook viewing and editing utility. ⁴ Also includes HyperCard XCMD player. ⁵ Saves files as self-running applications. ⁶ Left and decimal tab stops only. ⁷ Must use ResEdit to import sounds.

fects to an object so that its outline and interior fade in or out of the scene. The only downside to Magic's animation capabilities is that you cannot rotate or flip an object as it moves within the scene the way you can in On The Air.

Magic also provides its share of extras. It lets you move an imported PICT image inside an object, an effect it calls panning. Using the masking feature, you can hide portions of an image to prevent it from obscuring objects behind it. You can even record sounds using the built-in microphone supplied with newer Macintoshes like the LC and IIsi, or a third-party sound digitizer (a capability shared only by Cinematic).

To help you get started, Magic supplies a tidy collection of presentation templates complete with animation effects. The upcoming version 1.1 will support QuickTime, but not the Scrapbook; in light of Magic's inability to import a presentation from any of the three Ps, I have to wonder how many longtime users will take to a program that requires you to re-create your staple presentations from scratch. If you currently use Persuasion or one of the others and your primary interest is to spice up old slides with new activity, I prefer Cinematic.

Cinematic To create images, Cinematic comes equipped with its own 24-bit painting environment. It pales by

comparison to most dedicated paint programs—it provides no antialiasing to create soft edges, no magic wand to select areas of like color, and no way to create custom text effects—but so far as presentation programs are concerned, Cinematic's paint mode is as good as it gets.

When animating, Cinematic abandons the slide/scene metaphor used by other programs in favor of a straightforward collection of frames. Each segment in an animated sequence gets its own frame; each frame may be edited on its own and displayed for any length of time. To animate a painted image or text object, you have one of three choices. First, you can create an object in one

frame, transform the object in another frame, and automatically fill the in-between frames with transitional images to create a smooth sequence. Second, you can record the movement, scaling, rotation, or cropping of an image in real time. Cinemation creates the frames automatically. Third, you can draw frame-by-frame animation by hand (called cel animation). Though this process is necessarily time-consuming, Cinemation facilitates cel animation by supplying dimmed images of the previous frames that act as visual guides.

Updating an existing presentation with Cinemation is remarkably easy. You just import presentations (created in PowerPoint, Persuasion, or Presents) that are saved as Scrapbook files (see "Making Presentations Move"). Cinemation then converts each slide into an individual frame, and provides AutoMotion templates for automatically making text and graphics move on screen. To use an AutoMotion template, you select a kind of movement from the AutoMotion menu, such as Move Left, and Cinemation makes each of the objects (usually bullet points) fly out of the right margin of the screen to their proper place on the slide. As part of this automatic process, Cinemation creates all necessary frames for the completion of the animated sequence.

Adding Interactivity

WHILE ANIMATION SERVES TO ENLIVEN presentations, interactivity serves to make them more user friendly. Self-running presentations have long been a staple of trade shows and kiosks. Elevating the viewer from passive onlooker to active participant, however, has proved something of a problem. The choices have been prohibitively expensive (a HyperCard front end driving a CD ROM or laser disc player) or prohibitively limited (HyperCard by itself). And both choices involve a degree of programming that is beyond the capabilities or interests of most users.

Three programs provide interactive frame linking, so that a viewer can inspect different portions of a presentation depending on the buttons he or she selects.

InfoLynx InfoLynx provides no drawing or charting tools, no animation capabilities, and no transition effects. Instead, you assemble slide contents by entering text, importing PICT files, and transferring data via the Clipboard. When you create a text block, InfoLynx by default assumes it to be a button. You have only to tell the program which slide to display when the button is clicked on. As an

Making Presentations Move

In Cinemation, you can import presentations as Scrapbook documents and add motion and interactivity. To animate the plane, I imported it, changed the background color, and made it opaque (left). By adding new frames and using the Fill in Motion dialog box, I made the plane appear to move across the screen (middle). At right, the sequence of frames shows that the plane appears to fly from right to left.



added bonus, InfoLynx saves all files as self-running applications, so they may be run on any machine without using InfoLynx or a run-time version of the program. (This also prevents viewers from modifying your work.)

Unfortunately, that's all the good news I have to convey about InfoLynx. The interface is insanely complicated. Considering the fact that the program does nothing but create slides, link slides, and save them to disk, its 58 commands and 5 work modes must be some kind of record. The manual is generally well organized, but it lacks an index. There is no online help. So for now, InfoLynx is little more than a good idea.

Magic Links More straightforward and more versatile frame linking is available to users of Magic and Cinemation. In Magic, you may assign a link in response to a pause or a click. For example, you might instruct Magic to proceed to the next scene if the presentation remains idle for 60 seconds. You may also define any object to be a button. There's even an option

that lets you play an external PICS movie and return to the current frame.

Cinemation Linking Because Cinemation lets you link any single frame to any other frame in a presentation, it is easy to set up a simple navigation system in your presentation. As with Magic, you can initiate a link when the viewer clicks on a button. You can also link upon the completion of a sound or QuickTime movie or when the viewer clicks anywhere on screen. After the prescribed action, Cinemation can transfer to any named frame, it can open and play a different presentation stored on disk, or it can interrupt playback.

After you have created your link, Cinemation displays a small icon in that frame so there's no question of where you've put a link in your presentation. When you double-click on the link icon, a dialog box appears telling you where the link will take you and allowing you to modify the link if you so desire. In Magic, by contrast, there's no visual reference when, where, or if you've set a link.

And keep your eye out for Interactive Solution's MovieWorks, which is designed to allow you to create animated, interactive presentations and QuickTime movies and is due to ship in late May.

MW EDITORS' CHOICE

Slide Presentation

Aldus Persuasion 2.1 Persuasion offers layered builds and automated templates, has a proven track record, and has recently introduced full support for System 7, including QuickTime. **Company:** Aldus Corporation. **List price:** \$495.

Animation Only

On The Air 1.0 Straightforward and inexpensive, On The Air boils down the process of animating Scrapbook presentations into a handful of well-chosen options. **Company:** Meyer Software. **List price:** \$175.

Animation and Interactivity

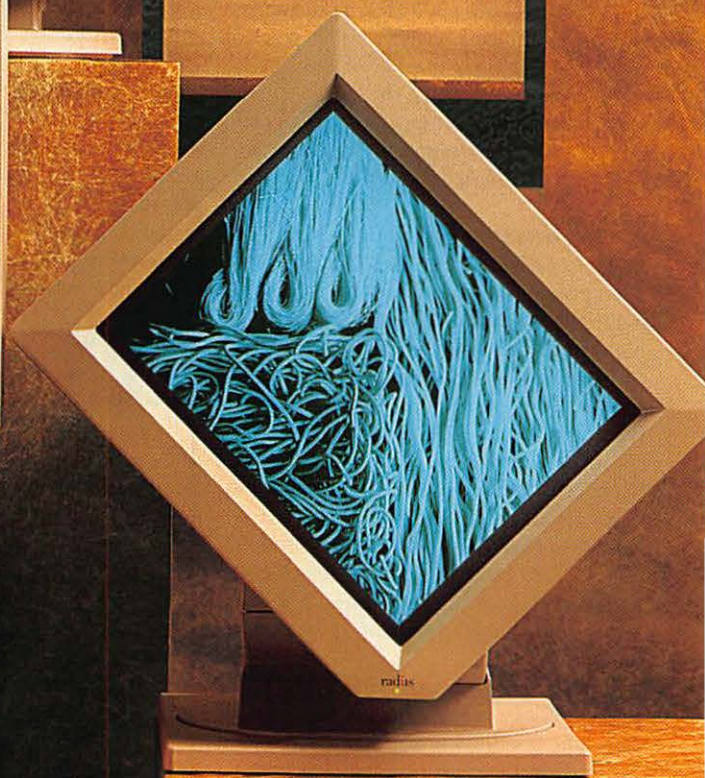
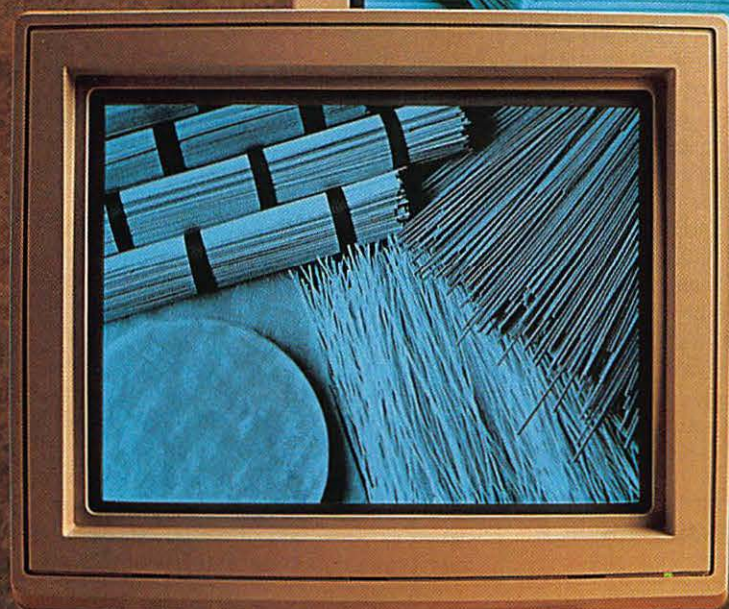
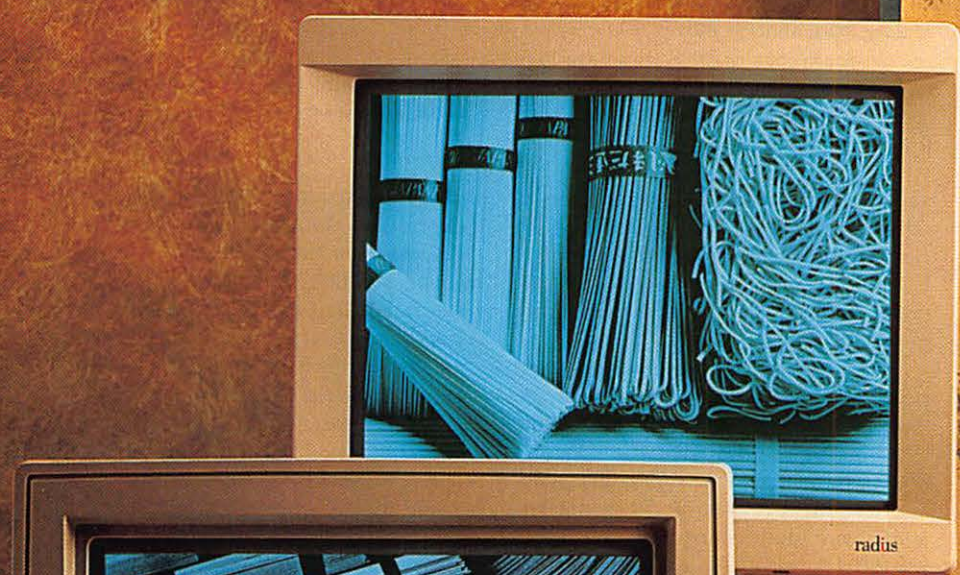
Cinemation 1.0 Cinemation offers real-time recording, scaling and rotation animation, custom frame linking, and support for QuickTime movies. **Company:** Vividus. **List price:** \$495.

The Perfect Presentation System

IF YOU WANT TO COVER ALL OF THE bases—slide presentation, animation, and interactivity—you can't do better than the joined forces of Aldus Persuasion and Cinemation (combined list price: \$990). If you're looking for something a little less expensive and you're willing to sacrifice interactivity, you might try out More with On The Air (combined list price: \$570). Though it lacks the power of Persuasion's AutoTemplate feature, More is far and away a better product than either PowerPoint or Presents. **m**

See *Where to Buy* for contact information.

DEKE McCLELLAND imagines himself touring nationally with large-screen monitors to promote his books *Macintosh System 7: Everything You Need to Know* and *Macintosh A to Z* (both Sybex, 1992).



These monitors—(clockwise from top) the Radius TPD/21, Radius Pivot, and RasterOps 19" Mono/Gray Scale—topped our recommendations because of their clear, clean image quality.

MACWORLD LAB TESTS 8 PORTRAIT

AND 14 TWO-PAGE BLACK-AND-WHITE

AND GRAY-SCALE MONITORS

Black & White Monitors

COLOR MAY BE ENTICING, but it is not always appropriate. If you work primarily with text or desktop published documents that lack color, you may sacrifice speed, convenience, and a bundle of cash to use a color display.

Macworld Lab tested 22 portrait or two-page monochrome monitors, both black-and-white and gray-scale. The findings show clearly that not all monitors are created equal—although the monochrome display is a mature technology, there remain significant differences among vendors' offerings.

Macworld Lab found that the biggest differences were due to video boards, not the monitors themselves, since only a handful of companies actually manufacture monitors components. Four such manufacturers—Clinton, Hitachi, Philips, and Toshiba—account for all the CRTs (cathode-ray tubes) used in Mac monochrome displays, with Clinton and Philips accounting for the vast majority. Another four companies—Display Technologies, Hitachi, Ikegami, and Triam—supply most of the electronic components that control the CRT and interpret the signals coming from the video board.

The many vendors in the display market differentiate their display systems by how well their boards control those displays. About half of the vendors use boards they designed, while the other half use boards made by Lapis Technologies, which tailors boards for each vendor (see "Monochrome Monitor Features"). The Lapis boards differ primarily in the video-signal rate and pattern, which are slightly different for each vendor's monitor.

Theoretically, video boards can generate dramatic differences in monitor display quality, since that quality directly depends on the information coming

BY GALEN GRUMAN

Black & White Monitors

from the video board. The better the board's signals are *synchronized* to the monitor's electronics—sent in the same pattern expected by the monitor—the better the image quality. The better the board can calculate *gray levels*—percentages of black—the better the image quality for gray-scale displays. And the better the boards for black-and-white monitors *dither*—simulate color or gray images in a pattern of black dots and white dots—the better those monitors' image quality.

As an example of the difference a video board can make, Macworld Lab compared the Radius Full Page Display using the internal video of a Mac IIci, a Radius PrecisionColor 8 video board, and the Radius Pivot video board. The results of using the same monitor with three video sources show subtle differences that a business user would be unlikely to care about but that a desktop publisher or artist would notice. For example, the 16 gray shades supported by the built-in video mean that light grays tend to wash out and that some banding is noticeable. With the

PrecisionColor board, the display retains image subtleties, while the Pivot board tends to blacken darker grays and whiten lighter grays.

Of course, a video board can't make a monitor better than it is—a poor monitor will still have poor display even with a good board. The monitor sets the maximum display quality level; the board determines if that maximum is reached.

In practice, vendors' boards are comparable in quality. Most users will find special features like multiresolution display or hardware-controlled pan and zoom to be the biggest distinguishing factors among video boards.

Built-in Video

YOU DON'T ALWAYS NEED A VIDEO BOARD TO MAKE a monitor work. The built-in video circuitry on the LC, LC II, IIci, IIsi, and Quadras supports 15-inch portrait monitors in black-and-white or with up to 16 levels of gray. The number of grays depends on how many pixels the monitor has and how much memory you have for video. On a portrait monitor, a Mac has enough memory to handle 16 gray levels. For two-



Monochrome Monitor Tests

For brightness and contrast longer bars are better. For distortion and gray linearity, shorter bars are better. For ELF the lighter the bar the better. The best result in each test is indicated in red.

Maximum Brightness

Most people prefer a brighter monitor. We turned up the screen's brightness as high as it could go without showing scan lines. A reading of less than 20 footlamberts is considered dim; most monitors are much brighter.

Contrast Ratio

The better the contrast, the better you can see details in both light and dark areas of an image. We calculated the ratio between the luminance of white and black squares at several spots on the screen. Six or higher is good.

Distortion

A monitor's level of distortion determines how geometrically correct an object appears on screen—a 1-inch square should appear as a perfect square, not some other kind of rectangle. A measurement of 0 is perfect.

Gray Linearity

Gray linearity shows how well a monitor displays shades of gray. The ideal monitor produces, say, 60 percent gray when the user specifies 60 percent gray for an image. A measurement of 0 (no difference from ideal) is perfect.

	Longer bars are better.	Longer bars are better.	Shorter bars are better.	Shorter bars are better.
Portrait				
Macintosh 12" Monochrome*	35.8	7.5	5	76.8
Apple Macintosh Portrait	49.9	6.3	4	22.9
Cutting Edge 15" Full Page Grayscale	39.7	7.7	3	**
Ehman 15" Full Page Monochrome	32.0	7.0	5	**
Generation Analog Full-Page	23.4	6.0	2	32.2
Mirror Portrait	37.5	6.5	5	101.7
Mobius One Page	34.5	6.3	4	**
Radius Full Page	47.6	6.3	0	62.4
Radius Pivot	48.5	5.9	3	93.6
Two-Page				
CalComp DrawingCard GrayVision	26.8	6.1	3	55.8
Mass Microsystems Rival 19" Grayscale	32.3	3.7	4	161.6
Mass Microsystems Rival Monochrome	32.1	4.0	5	**
Mirror 19-inch Two-Page	39.0	4.3	7	**
Mobius Two Page	43.1	3.9	4	**
Nutmeg 19	38.8	4.3	5	**
Radius TPD/19	39.2	4.1	3	**
Radius TPD/21	38.4	5.9	4	**
RasterOps 19" Mono/Gray Scale	34.3	6.7	5	71.1
RasterOps 21" Mono/Gray Scale	35.4	4.0	6	148.2
Relax Ikegami Gray Scale	33.0	3.8	5	191.2
Sigma Designs L-View MultiMode	36.3	3.9	5	**
Sigma Designs SilverView	33.4	5.7	0	96.7
SuperMac 21" Platinum Two-Page	36.5	6.7	0	98.2

* Although it is not a portrait monitor, Apple's Macintosh 12" Monochrome is included as a reference point.

** Black-and-white monitors do not display gray, so no values are shown.

Footlamberts

Ratio of white to black

64ths of an inch

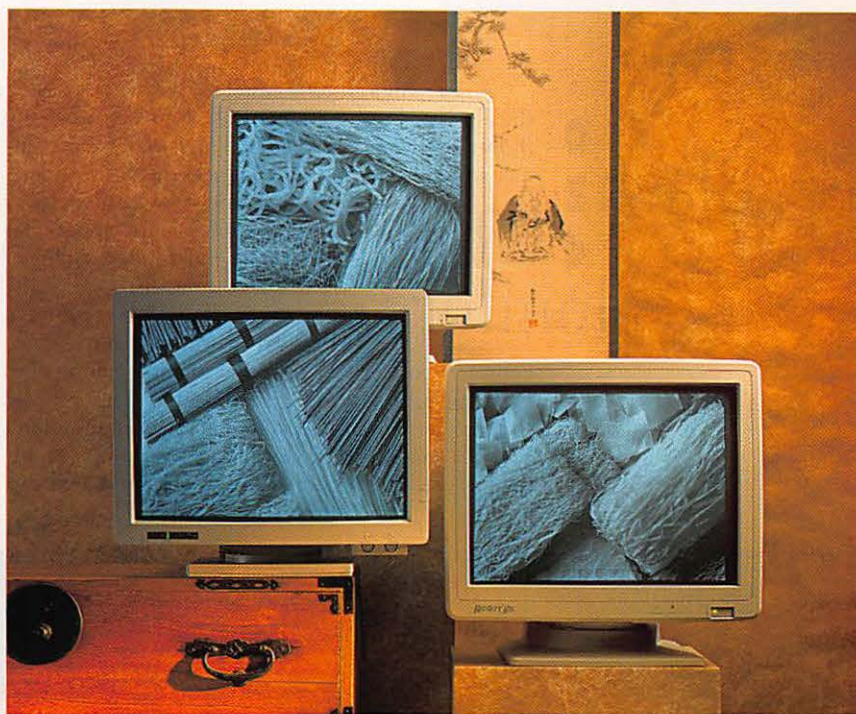
Sums of percent variance from ideal values in 12 tests

page monitors that use built-in video, the amount of video RAM (VRAM) needed increases based on the resolution. Any Quadra with 1MB of VRAM lets you display 256 levels of gray, while a Quadra 700 with the default 512K of VRAM limits you to 16 levels. (A Quadra 900 and 950 come standard with 1MB.)

The built-in video reduces the total cost of a display system, since you need buy the monitor only. But there are some trade-offs: a video board works more quickly than built-in video because it is optimized for a specific monitor, it usually includes VRAM, and it supports more levels of gray for gray-scale monitors.

Generally, a video board increases speed by 50 to 75 percent compared to built-in video, except on the Quadras, where the speedup will be about 25 percent, since the Quadras' built-in video is more efficient than that of other Macs. The more text-oriented your work, the less speedup you'll see. If you plan to work primarily with text—with word processors or spreadsheets—the speed of the built-in video is fine.

For publishing or image editing, you'll probably want a two-page monitor, which requires a video board for most combinations of Macs and monitors.



ELF Emissions

The bars show the change in emission levels of extremely-low-frequency electromagnetic emissions as one gets farther from the monitor; the more intense the color, the more intense the emissions. Measurements of less than 1 milligauss (mG) are too weak compared with normal background emission levels to be measured accurately. Instrument accuracy is ± 0.2 mG. We tested ELF emissions with a Combinova MFM-10 meter from Ergonomics, of Southampton, Pennsylvania.

Lighter bars are better.

4 inches	12 inches	28 inches
10.0	1.8	0.3
46.0	8.1	1.3
35.7	6.6	1.0
32.1	5.9	1.0
18.6	2.5	0.3
18.0	2.5	0.3
24.9	3.5	0.5
18.5	2.7	0.4
19.3	2.8	0.4
24.6	5.6	1.1
30.1	6.7	1.1
31.8	6.4	1.1
10.3	1.9	0.3
11.3	2.0	0.3
11.2	2.2	0.3
6.2	1.2	0.2
26.0	5.4	1.0
21.3	5.1	0.9
28.6	6.4	1.1
30.9	6.3	1.0
35.2	6.4	1.1
26.7	6.0	1.1
20.5	4.9	0.9

Distance (in inches) from front of monitor. ELF emissions are in milligauss.

If you work extensively with scanned gray-scale images, such as photographs, strongly consider getting a video board with a graphics accelerator to manage all those pixels fast enough to keep up with your work. Most such boards are designed for color monitors but will also work with gray scale. If you go this route, you need an 8-bit—not a 24-bit—board to get 256 levels of gray tones.

Interpreting the Tests

BECAUSE DISPLAY MANUFACTURERS HAVE YEARS of experience designing and building monitors and video boards, the differences between monitors are not very sharp—quality usually ranges from good to excellent. Keep this in mind when looking at the results from the Macworld Lab tests. They point out measurable physical differences that are not always perceptible or critical. Subjective issues like amount of glare, color cast, or position of controls—as well as support and service—should be your primary concerns in selecting a monitor.

The Macworld Lab tests do give you an indication of the companies' technical standards, which is a good indication of overall commitment to quality. A company whose display's quantifiable performance differs significantly from that of its competitors' display either is a cut above or is cutting corners.

That's not to say the Macworld Lab results bear no relationship to perceived quality—a monitor that varies wildly from proper gray levels in a gray-linearity test, for example, will have noticeably inferior display quality.

Although most monitors vary from the ideal, they fall within a range that most people find acceptable. A good example of this is distortion. Most monitors are off by at least $\frac{1}{4}$ inch, or nearly 2 percent, yet this amount of distortion is not noticeable. If you have specialized needs, such as minimal distortion across a screen because you are making fine measurements of viewed images, then the Macworld Lab results for areas like distortion will become more important to your evaluation of the best monitor.

Desktop publishers will probably prefer the true gray tones of the CalComp Drawing Card, RasterOps 21" Mono/Gray Scale, and Sigma Designs SilverView (clockwise from top). Of these three, the CalComp was our favorite; overall, it was a clear second choice to the RasterOps 19" and Radius TPD/21 for two-page displays.

Black & White Monitors

A group of *Macworld* editors subjectively assessed the displays' brightness, contrast, clarity, and fidelity (how closely an on-screen image matches the original; for example, how well grays match the levels specified, and how geometrically correct various shapes appear), as well as glare and the accessibility of the displays' controls.

Antiglare displays require a trade-off in image quality, since common coatings blur pixels, making fine images fuzzier. Shields from Optical Coating Laboratories (offered by Mass Microsystems, for example) don't blur the image but are expensive and lower brightness. Most vendors prefer not to use antiglare coat-

ings and expect users to close window blinds or use indirect lighting to reduce glare.

My final recommendations are based on a combination of the *Macworld* Lab test results, the subjective evaluations, service and support information, and the displays' pricing.

Evaluating Portrait Displays

FOR PORTRAIT DISPLAYS, WE LOOKED AT PRODUCTS from Apple, Cutting Edge (and its sister company, Ehman), Mirror Technologies (and its sister company, Generation Systems), Mobius Technologies, and Radius. All show 640 by 870 pixels—enough to display a full letter-size page. At press time, Ehman/Cutting Edge had closed. Discussions were

MONOCHROME MONITOR FEATURES

Company	Product	Tested	Price	Built-in Video Supported	Video Board Price	Macintoshes Supported	Diagonal Size of Screen (in inches)	Active Screen Area (w × h, in inches)
PORTRAIT DISPLAYS								
Apple Computer	Apple Macintosh Portrait Display	●	\$1099	○	\$699–\$1499	II series, Quadras	15	8 × 10.9
Cutting Edge	Cutting Edge 15" Full Page Monochrome Display	○	\$899	○	included	all but Classic II	15	7.8 × 10
	Cutting Edge 15" Full Page Grayscale Display	○	\$749	●	NA ¹	LC, IIci, IIsi, Quadras	15	7.8 × 10
Ehman	Ehman 15" Full Page Monochrome Display	●	\$479	○	included	all but Classic II	15	7.8 × 10
	Ehman 15" Full Page Grayscale Display	●	\$459	●	NA ¹	LC, IIci, IIsi, Quadras	15	7.8 × 10
Generation Systems	Generation Analog Full-Page Display	●	\$795	● ²	\$400	all but Plus, Classic II	15	8 × 10.9
Lapis Technologies	Lapis Full Page Display	○	\$899	○	included	all but Classic II	15	7.8 × 10.5
	Lapis Gray Scale Display	○	\$749	● ²	\$299–\$649	all but Classic II	15	7.8 × 10.5
Mirror Technologies	Mirror Portrait Display	●	\$449	● ²	\$150	all but Plus, Classic II	15	8 × 10.9
Mobius Technologies	Mobius One Page Monitor	●	\$595	● ²	included	all but Plus, Classic II	15	8.2 × 11
Radius	Radius Full Page Display	●	\$699	●	\$229	all but Plus ³	15	8.2 × 11
	Pivot	●	\$849	●	\$299	all but Plus, SE ³	15	8.2 × 11
Sigma Designs	PageView GS	○	\$795	● ²	\$699–\$1499 ⁴	IIci, IIsi, Quadras	15	8 × 10.7
	PageView Portrait	○	\$695	○	\$295	LC, II series, Quadra	15	8 × 10.7
	SilverView Portrait	○	\$2695	○	\$995	II series, Quadras	21	17.5 × 19
TWO-PAGE DISPLAYS								
CalComp	DrawingCard GrayVision	●	\$1495	○	included	II series, Quadras	21	19.3 × 18.2
Cutting Edge	Cutting Edge 19" Dual Page Monochrome Display	○	\$1499	○	included	all but Plus, Classic, Classic II	19	14.3 × 10.8
	Cutting Edge 19" Dual Page Grayscale Display	○	\$2299	○	included	all but Plus, Classic, Classic II	19	14.3 × 10.8
Ehman	Ehman 19" Dual Page Monochrome Display	○	\$795	○	included	all but Plus, Classic, Classic II	19	14.3 × 10.8
	Ehman 19" Dual Page Grayscale Display	○	\$1395	○	included	all but Plus, Classic, Classic II	19	14.3 × 10.8
Generation Systems	Generation Two-Page Display	○	\$1495	○	included	all but Plus, Classic II	19	14.2 × 10.7
Lapis Technologies	Lapis Dual Page Display	○	\$1399	○	included	all but Classic II	19	13.8 × 11.8
Mass Microsystems	Rival Monochrome Display	●	\$799	○	\$429	all but Plus, Classic, Classic II	19	13.7 × 11
	Rival 19" Grayscale Display	●	\$1239	○	\$999	SE/30, II series, Quadras	19	13.7 × 11
Mirror Technologies	Mirror 19-Inch Two-Page Display	●	\$799	○	included	all but Plus, Classic II	19	14.2 × 10.7
Mobius Technologies	Mobius Two Page Display	●	\$795	● ²	included	all but Plus, Classic II	19	13.7 × 11
Nutmeg Systems	Nutmeg 19	●	\$1235	○	included	all but Plus, Classic II	20	14 × 11
	Nutmeg 19G	●	\$1799	○	included	SE/30, II series, Quadras	20	14 × 11
PCPC	ShadowGraph	○	\$1795	○	included	II series, Quadras	19	13.5 × 10.8
Radius	Radius TPD/19	●	\$1099	○	\$459–\$599	SE, SE/30, II series, Quadras	19	14 × 10.8
	Radius TPD/21	●	\$1399	○	\$459–\$599	SE, SE/30, II series, Quadras	21	15.5 × 11.9
RasterOps Corporation	19" Mono/Gray Scale Monitor	●	\$999	● ^{6,7}	\$399–\$579	Classic, SE/30, LC, II series, Quadras	19	14.2 × 10.6
	21" Mono/Gray Scale Monitor	●	\$1299	● ^{6,7}	\$399–\$579	Classic, II series, Quadras	21	15 × 11.2
Relax Technology	Ikegami Gray Scale Package	●	\$799	○	included	II series, Quadras	19	14.2 × 10.7
Sigma Designs	L-View MultiMode	●	\$1295	○	\$395	all but Plus, Classic, Classic II	19	19 × 18
	SilverView	●	\$1395	○	\$795	all but Plus, Classic, Classic II	21	19 × 17.5
SuperMac Technology	21" Platinum Two-Page Display	●	\$1199	○	\$399–\$1599	LC, II series, Quadras	21	15 × 11.2

● = yes; ○ = no; ABV = Apple built-in video; C = Clinton; CO = company's own; D = Display Technologies; H = Hitachi; I = Ikegami; L = Lapis; P = Philips; T = Toshiba; TR = Triam; Z = Zenith.

¹ Works only with built-in video. ² Does not support LC internal video. ³ Requires PowerView SCSI interface to connect to Classic II. ⁴ Requires Apple 8•24 or 8•24 GC board. ⁵ Requires \$995

⁶ Supports only Quadra built-in video. ⁷ Requires special cable available from RasterOps.

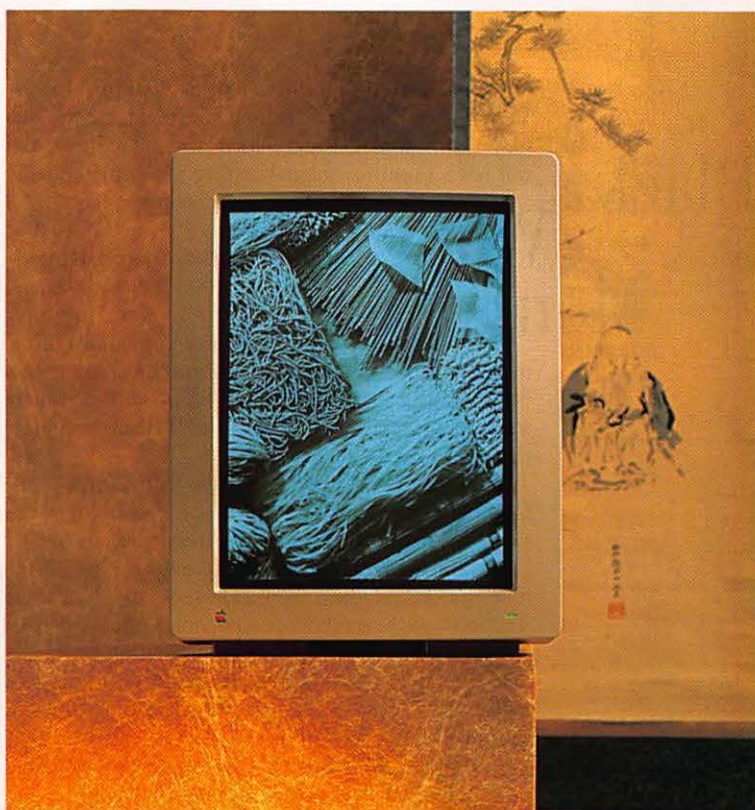
under way for another company to buy its inventory for resale, but no final decisions had been made about the products' future. Two other companies offer portrait displays but could not provide evaluation units: Lapis Technologies and Sigma Designs.

Although portrait monitors are typically used for black-and-white applications like word processing, most support gray scale. Exceptions include the Lapis Full Page Display and the Mobius One Page Monitor. The others support 16 levels of gray when used with the Mac's built-in video; they typically support 256 levels of gray when used with a video board.

All the tested portrait monitors work off the built-in video circuitry for those Macs that have it, except the LC and LC II. The LCs' built-in video is

Standard Resolution (w × h, in pixels)	Pixel Density (at standard resolution, in dpi)	Gray Scale Supported	Component Sources (tube/ electronics/ video board)
640 × 870	80	●	T/P/CO
640 × 870	80	○	C/TR/L
640 × 870	80	●	C/TR/ABV
640 × 870	80	○	C/TR/L
640 × 870	80	●	C/TR/ABV
640 × 870	80	●	C/Z/CO
640 × 870	80	○	C/TR/CO
640 × 870	80	●	C/TR/ABV
640 × 870	80	●	C/Z/CO
640 × 870	78	○	P/Z/CO
640 × 870	78	●	C/Z/CO
640 × 870	78	●	C/CO/CO
640 × 870	80	● ^a	C/CO/ABV
640 × 870	80	○	C/CO/CO
870 × 1152	72	●	C/CO/CO
1152 × 870	72	●	H/H/CO
1024 × 768	72	○	P/D/L
1024 × 768	72	●	P/D/L
1024 × 768	72	○	P/D/L
1024 × 768	72	●	P/D/L
1024 × 768	72	○	C/Z/CO
1024 × 828	74	○	P/D/CO
1024 × 826	75	○	P/D/CO
1024 × 826	75	●	T/I/ABV
1024 × 768	72	○	C/Z/CO
1024 × 826	75	○	P/Z/CO
1024 × 768	72	○	P/I/CO
1024 × 768	72	●	P/I/CO
1024 × 768	72	●	P/I/CO
1152 × 882	82	●	P/CO/CO
1152 × 882	74	●	T/CO/CO
1024 × 768	72	●	H/H/CO
1152 × 870	77	●	T/I/CO
1024 × 768	72	●	P/I/CO
1024 × 768	72	○	C/CO/CO
1152 × 870	72	●	C/CO/CO
1152 × 870	77	●	C,T/H/ABV

gray-scale video board; otherwise displays black-and-white only.



incompatible with most monitors, whether monochrome or color, because it does not conform to video standards the way the built-in video of other Macs does. (The LCs' video is, of course, compatible with Apple's monitors.) If you have a Mac that lacks built-in video, or want extra features like acceleration or better gray-scale support, you can get a video board bundled with a monitor or purchase a board separately. (Acceleration typically requires buying a board designed for color displays but that also works for gray scale; color users need acceleration more than monochrome users do.)

In our subjective evaluation we found few differences among the portrait displays we tested—not surprising, since most use monitors prepackaged by Zenith with identical tubes made by Clinton. However, because monitor quality can vary, even from the same manufacturer, it is wise to look at a monitor in use before purchasing it.

Still, one display stands out—the Radius Pivot, which has what is clearly the best quality when used with its video board. Not that it was perfect in our tests: we saw occasional banding in grays. In addition to providing a clearer, higher-contrast display than the other monitors, its software lets you use the Pivot either in landscape mode as if it were a 14-inch monitor or in portrait mode. This is a neat trick, but by itself is not worth the higher cost (\$849) for many users. But the Pivot's high quality, which is the most important consideration in buying a display, is worth the extra money. Companies buying many monitors are likely to get both a price break and a product that adjusts to a range of user needs and preferences.

If your budget forces you to compromise, pick any of the other displays, except the Apple portrait, based on the best deal you can get. (The Apple portrait performed only fairly in the subjective evaluations, despite being the standard by which many people measure a display.)

The Apple Macintosh Portrait Display (above) has the weakest image quality of the portrait monitors tested, as did the recently discontinued Apple 21" monitor. The Apple monitor also has one of the highest prices.

Black & White Monitors

An intriguing product is Sigma Designs' SilverView Portrait, whose 21-inch size means it can display almost two 11-by-17-inch pages. While we did not have a unit for formal testing, its display quality was high in subjective tests.

Evaluating Two-Page Displays

THOSE SEEKING TWO-PAGE DISPLAYS will find more options.

There are more companies offering products and more sources for the components they use (although Clinton and Philips still dominate the tube suppliers, and Zenith and Ikegami dominate the electronics suppliers).

We tested two-page displays from Apple, CalComp, Mass Microsystems, Mirror Technologies (its sister company, Generation Systems, has an identical product, which we did not have for testing), Nutmeg Systems, Radius, Sigma Designs, and SuperMac Technology. Several other companies offer two-page displays but could not provide evaluation units, including Ehman/Cutting Edge, Lapis Technologies, and PCPC. All were changing their product lines or suppliers at the time of testing.

Of the monitors tested, the Apple two-page had the poorest quality because of its washed-out look at high brightness settings and overly dark look at lower settings. That monitor has since been discontinued, so it is not included in our benchmarks.

Several monitors did well. Our favorites were the Radius TPD/21, RasterOps 19-inch gray-scale display, and Sigma Designs SilverView monitors. The CalComp display was a clear second choice. The others were decent—not outstanding, but certainly not bad.

Among our five favorites are all four monitors that display true gray rather than the bluish gray that has become the signature Macintosh display color—these are the CalComp display, both RasterOps models, and the Sigma Designs SilverView. There is no objective reason why either gray color is better, although people working in publishing or image editing are likely to prefer a monitor whose display more closely matches what is printed. Among the true-gray monitors, we found the RasterOps 19" best due to superior subjective ratings. All units displayed gray levels very well. The SilverView had a noticeable yellow cast to its gray that might bother some users, but it does not affect image fidelity.

Many monitors performed passably in most of our categories but excelled or fell flat in one or two. For example, we strongly preferred the Radius 21-inch monitor's brightness level and the RasterOps' contrast and screen flatness. But we disliked the hard-to-reach controls of the Mirror/Generation Systems and Nutmeg monitors and found the glare from the Radius 19-inch and Sigma Designs L-View MultiMode to be more noticeable than we prefer.

Understanding Multiple Resolutions

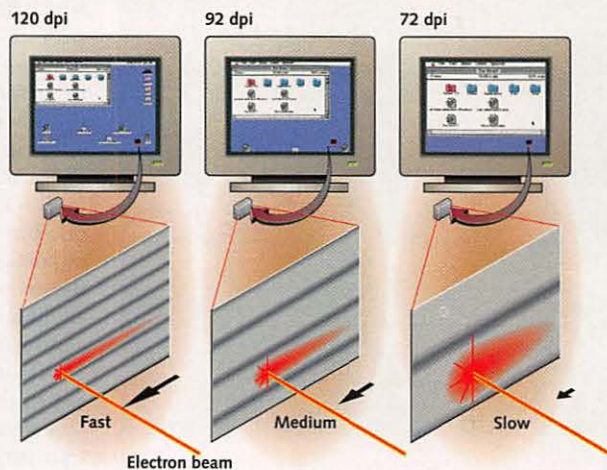
Though common to the DOS universe, the concept of multiresolution monitors that let you view an image at different sizes is new to the Mac platform. In the monochrome market, Sigma Designs offers the L-View MultiMode, which supports six resolutions: 36, 46, 60, 72, 92, and 120 dots per inch.

The term *resolution* implies amount of detail when it is used in printing and photography; an imagesetter has higher resolution than a laser printer and creates higher-quality images by using more and finer dots.

But in displays, viewing an image at 120 dpi does not mean edges and curves will be smoother than the same image at 72 dpi, as it would in printing or photography. Instead, resolution means the same dots seen at 72 dpi will be displayed as smaller dots positioned closer together. The effect is like a photocopier, bringing in more of the image by reducing it. You can enlarge the image by reducing the dpi, although it will get coarser.

Multiresolution displays allow you to switch from a true-size view to a bird's-eye view or to a close-up, which is especially helpful in layout. And unlike similar zoom controls within page-layout programs, display-based controls show enlarged or reduced images without loss of detail.

Multiresolution displays vary resolution by changing the speed of the electron beam that "paints" an image on the inside of the monitor tube. The MultiMode board, for example, has three active settings—120, 92, and 72 dpi. (It draws two lines with identical data to achieve 60-, 46-, and 36-dpi settings.) At 120 dpi, the beam sweeps across the tube quickly, illuminating only a few phosphors at a time to form fine lines. At 92 and 72 dpi, the beam sweeps proportionately more slowly, illuminating larger groups of phosphors to create thicker lines.



Small Mac, Big Screen

Many owners of compact Macs like the SE and the Classic would love to have a large monitor in place of the tiny screen sealed in the Mac's case. But most compact Macs don't have the computational resources to drive such a large display.

There are no video boards for the Classic II, since its design precludes inexpensive or easy solutions. The advent of the PowerBooks, however, has led several companies to announce video options that use the SCSI port. These options will allow you to hook color or monochrome 13-inch or portrait monitors to any SCSI port, including the Classic II's. Radius is shipping its PowerView SCSI adapter. Sigma Designs also recently introduced its Power-Page, which uses the SCSI port and has a video board built in to the monitor, so no bulky adapter is needed.

Owners of the Mac Plus will also be hard put to find solutions, although they do exist. One of the more innovative is MicroMac's approach of upgrading a Plus (or an SE or SE/30) by repackaging its components, plus some new ones, in a new box that more resembles an LC or IIsi. Lapis Technologies offers the more conventional solution of a video board, the DisplayServer Plus, that fits into the Plus.

SE and SE/30 owners will have little trouble finding boards for their Macs. "Monochrome Monitor Features" lists two-page displays that support those Macs.

An unusual large-monitor solution for compact Macs is the BTM 14" High-Resolution Monitor, which works with all compact Macs but the Classic II—including the Mac 128K. This \$440 monitor is aimed at the visually impaired, since its purpose is to make the image bigger, not to add more pixels for sharper image display or to provide two-page viewing.

But as you might expect in subjective evaluations, we didn't agree on everything. For example, some members of the testing team thought the Nutmeg monitor offered very good gray display, some thought it was fair, and others thought it was merely adequate. Likewise, we disagreed about the curvature of images shown on the CalComp monitor, with some thinking it was too curved at the bottom and others thinking it was fair or good.

Because selecting a monitor is so subjective, you should look at any monitor before you buy to make sure that you want to look at it day in and day out for the next few years.

In most cases, display costs are comparable, when you factor in the display board (sometimes it's optional, sometimes it's included). Exceptions are the Cutting Edge 19" Dual Page Grayscale Display (\$2299), the Mass Microsystems Rival 19" Grayscale Display, and the Sigma Designs SilverView, which list for about \$2200 if you buy a video board for them—that's about 30 percent more than most two-page gray-scale competitors. While we strongly like the Mass Microsystems and Sigma Designs displays, their list prices are good cause to look elsewhere.

Quadra owners, however, will find that four monitors—the Mobius Two Page Display, both RasterOps monitors, and the SuperMac 21-inch monitor—may have a price advantage because they work from the Quadras' built-in video, which means a video board is not needed. However, more video RAM will be needed to drive them at their high resolutions (you'll want 2MB of video RAM), so the cost of extra memory may balance that of a video board—it depends on how much VRAM you already have.

Commonalities and Differences

ALTHOUGH THE LIMITED NUMBER OF SUPPLIERS to display vendors restricts choices, especially for portrait monitors, the continuing movement to a market of mix-and-match components gives vendors the

opportunity to lower costs and standardize basics, and users the opportunity to enjoy special, custom features. For example, Mirror has added ADB ports to its monitors to make it easier to move the Mac out of the way and still be able to plug in keyboards and input devices. Sigma Designs offers a multiresolution feature (see "Understanding Multiple Resolutions"). And Radius offers a display, the Pivot, that works in two orientations. Increasingly, innovations like these will distinguish displays; the basic elements—the tubes and electronics—will become more standard.

And Apple's trend of providing built-in video will cause video-board makers to add features that will keep users buying boards that would otherwise be unnecessary. For example, RasterOps offers an extended desktop (a virtual screen, which is larger than your monitor can show at once) and hardware pan and zoom to navigate through the extended desktop quickly.

These changes and the fragmentation of product offerings into monitor-only and monitor-plus-video-board groups can be confusing. Fortunately, many vendors offer solid solutions to fit the various Mac models—new and old—and the diverse needs that users have. **m**

See *Where to Buy* for contact information.

Macworld Lab testing supervised by DANNY LEE.

MW

EDITORS' CHOICE

Portrait Displays

Pivot Its exceptional quality and the ability provided by its software to work in two orientations makes the Pivot a natural top choice. **Company:** Radius. **List price:** \$849; video board \$299.

Two-Page Displays

RasterOps 19" Strong brightness, sharp contrast, and low curvature distinguish this monitor. **Company:** RasterOps Corporation. **List price:** \$999; ClearVue video board \$399 for monochrome, \$579 for gray-scale.

Radius TPD/21 A strong performer in gray fidelity, brightness, and screen curvature, this display offers the familiarity of the Apple blue-gray standard. **Company:** Radius. **List price:** \$1399; two-page display video board \$459.

SPREADSHEETS THAT COUNT

*How do Lotus 1-2-3
and Resolve
stack up against Excel?*

BY CHARLES SEITER

There are, we must assume, more difficult things than beating Microsoft Excel in the Mac market. Pitching a perfect game in the World Series seems to be one such task; reducing the national debt looks like another. Nonetheless, for the last five years the only spreadsheet providing serious sales competition for Excel has been the spreadsheet built into the integrated application Microsoft Works.

This does not overstate Excel's historical dominance. The last time *Macworld* pitted Excel against its rivals (see "Can Excel Be Beaten?" November 1989), we found that Informix Software's Wingz 1.0 was faster than Excel 2.2 at most numeric tasks, and that Ashton-Tate's Full Impact 1.1 was tops for its ease-of-use and interface refinement. Since then, Excel 3.0 has simply gobbled up the best features of those programs and continued its hold on more than 90 percent of Mac spreadsheet users.

Now Excel is facing two formidable competitors that have the resources for a concentrated corporate assault on its position. Resolve, introduced by Claris last year, employs Wingz's excellent computation and graphing code (Informix sold the code to Claris), and Resolve has this additional recommendation: Claris is not going to be forced out of the Mac software market anytime soon.

Similarly, Lotus 1-2-3 is a solid Mac product, and it's backed by a company that won't lose interest in selling spreadsheets. In fact, there are about twice as many registered Lotus users worldwide as there are Macintoshes, according to Lotus.


To help you determine which of these programs is right for you, I've compared Excel with Lotus 1-2-3 and Resolve in a variety of function categories—computation, editing and auditing, graphics, macros, database access, and connectivity. I've also picked my overall favorite among the three contenders.

I've concentrated these evaluations on Excel, Resolve, and Lotus 1-2-3 because they are directly competitive as full-featured, dedicated spreadsheet programs. I didn't include Microsoft Works and Claris Works because they are not dedicated spreadsheet packages (see "All-in-One Programs," *Macworld*, June 1992, for a review of those programs). Full Impact isn't included in this review, as its future was unclear at press time. Although Borland International, which acquired Ashton-Tate and its products last year, is still supporting and selling Full Impact, the company hasn't disclosed its plans for the program. And while a new version of Wingz is on the



way, these days Informix is selling Wingz mostly to large corporate customers who will use it as the basis for developing their own internal, customized spreadsheet/database programs. For that reason I opted not to review Wingz this time around.

COMPUTATION



	Excel	Resolve	Lotus 1-2-3
computation	✓		
editing/auditing			
graphics			
macros			
database access			
connectivity			

IF YOU AREN'T CRUNCHING BIG NUMBERS, you can get along with calculator DAs, computed fields in databases, or special-purpose programs (Intuit's Quicken, for example, is probably what you should use for checkbook balancing instead of a spreadsheet). But if you are wrestling with a lot of numerical data, both the range of mathematical/financial functions and the computational efficiency of a spreadsheet are of primary importance.

For most business or home users, there is no significant speed difference among the Big Three. For the benchmark known as Recalc Plain, I had to construct a very large (10,000-cell) worksheet to pry out speed differences of more than 1/10 second in a recalculation. The newer Macs, featuring 68030 systems with fast clock speeds, will erase even these small differences.

Each of the three programs employs a different approach to recalculation. Lotus has a clever background recalc scheme—the cells you see on screen are computed first; then, while you're looking at the results, other parts of the spreadsheet are recalculated. Microsoft spent years perfecting a minimal recalc scheme in which Excel's recalc looks only at the cells affected by the last entry. Resolve features Informix's original, lightning-fast Wingz code, although Resolve's interface takes some of the breeze out of the Wingz recalc. All of these spreadsheets approach the theoretical speed limit for the number of multiplications per second for any given computer.

For scientific computations, in which algorithm variations among the three programs bring out more recalc speed differences, both Resolve and Excel offer more functions than 1-2-3 does. Resolve is the unchallenged speed champion at computations involving transcendental functions; and Excel's array-handling capabilities (which

interpret formulas defined on blocks of cells rather than just on single cells) make it the first choice for matrix, linear algebra, and optimization problems that typify complex models in business.

Another advanced business computational feature in a spreadsheet is a *solver* for performing "what-if" analyses. Basically, a solver runs an accounting problem backward. Finding the interest rate that will enable you to keep payments under \$1000 per month on a \$150,000 house, for example, would be a simple back-solving, "what-if" variable on that mortgage problem. In this area, Excel has an elaborate multivariable solver that compares to stand-alone third-party products (see "What If?"). Lotus 1-2-3 has a basic solver that's at least fancier than anything you're likely to write as a macro. Resolve has some helpful advice in the manual about simple "what-if" problems, but it doesn't implement any special code.

On balance, Excel has many strengths and no weaknesses as a computational product—which is one good reason the program has been able to keep such a tight grip on the spreadsheet market.

EDITING AND AUDITING



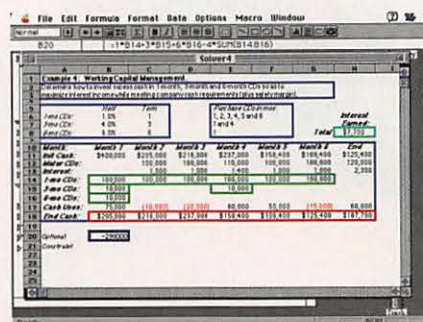
	Excel	Resolve	Lotus 1-2-3
computation	✓		
editing/auditing			✓
graphics			
macros			
database access			
connectivity			

EACH OF THE THREE SPREADSHEET programs enables you to attach notes to cells, but only in Excel can you pick the cells out for display one at a time. With 1-2-3 and Resolve, you have either all notes displayed or all notes hidden.

1-2-3 is unique among the three programs in that it lets you perform editing directly in worksheet cells—a nice but not essential touch that was years overdue. Excel stands alone with its outlining capability, a significant aid in editing large worksheets.

And speaking of large worksheets, with Excel and 1-2-3 you can split screens, which is great for scrolling through an endless spreadsheet in one screen while viewing the row and column headings in another. Unfortunately, Resolve, in an inexplicable omission, doesn't offer any form of split-screen capability.

At one time Excel had an edge in error-tracking, allowing users to trace chains of cell references. Resolve and 1-2-3




What If? Excel's solver sets the standard for spreadsheet "what-if" analyses. The solver can handle several different variables and direct details of computation through comprehensive dialog boxes. In this example, the solver is working to determine how to invest cash in various plans so as to get the best financial return with the least risk.

now implement the same tracking ability in different ways, but both programs are effective.

The big structural difference for auditing is 1-2-3's handling of true three-dimensional worksheets, which allows for a cleaner, more auditable design of complex worksheets than any other technique (see "Working in 3-D"). A 3-D worksheet has a single file name and can have interrelated worksheets as part of that same file. The separate worksheets are identified by letters (D:A1 is the first cell in the fourth sheet in the set, for example).

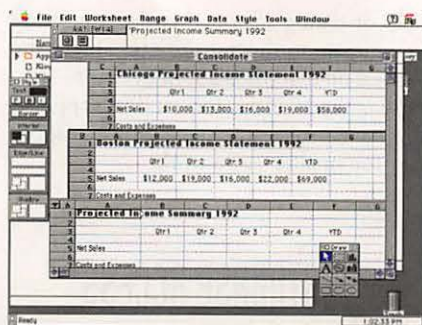
This arrangement allows sets of worksheets to be consolidated into a single file in order to share formulas, meaning that a basic structure only needs to be developed and audited once and applied across a set; it also means that a summary sheet will be small and easy to inspect. In the area of editing and auditing, outstanding 3-D capability tips the scales in favor of Lotus 1-2-3.

GRAPHICS

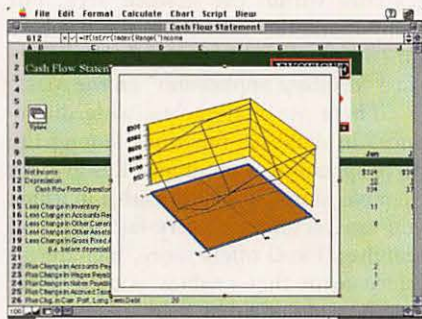


	Excel	Resolve	Lotus 1-2-3
computation	✓		
editing/auditing			✓
graphics			✓
macros			
database access			
connectivity			

A FEW YEARS AGO, 3-D CHARTS WERE AN avant-garde feature, and no spreadsheet program could compete in output quality with presentation graphics packages. Now these three programs can create line, bar, area, x-y, and pie charts in three dimensions (Resolve includes wire-frame



Working in 3-D Lotus 1-2-3 is the only one of the three spreadsheets reviewed that offers true 3-D worksheet files. Three-dimensional files are the best way to construct complex models and to create an interrelated set of spreadsheets that all contain similar categories of information. In this example, 1-2-3 is crunching the first-, second-, third-, and fourth-quarter financial data for two different sales offices and creating a third worksheet that will combine the information from the other two.



Wire-Frame Graphics Resolve is full of surprises, although many of them are left over from the underappreciated Wingz. Wire-frame plots, available in no other spreadsheet, are just one example.

plots and other exotica; see "Wire-Frame Graphics"), respectable drawing tools, adequate command of color, and the ability to manage charts as separate objects.

Within this mutually imitative profusion of graphics facilities, there are great similarities in output quality but wide differences in the amount of effort required to make a boardroom-quality presenta-

tion. Excel, for example, has added a graphing icon to its tool bar in 3.0, letting you, with a single click, create a chart for the data you have selected.

Instant access to the somewhat dated Excel charting facilities doesn't address the real problem, though: Excel charts are modified with complex menus, exist in separate windows, and aren't truly integrated graphics objects. An implicit admission by Microsoft that charting needs an overhaul may be evident in its plans for version 4.0. (Microsoft's upgrade to Excel should be available by the time you read this. Among other features, 4.0 adds 3-D surface charts and polar charts, as well as QuickTime support. For more information, see *Macworld News*, May 1992).

Resolve offers more graph types (3-D, wire-frame, and polar charts, for example) than Excel does, approaching the scope of such programs as DeltaPoint's Delta-Graph Professional, and you manipulate the graphs through a clear and intuitive set of dialog boxes. In fact, Resolve looked like the last word in charting simplicity until 1-2-3 appeared.

Remarkably, considering that Lotus spent years inflicting impossibly difficult and inadequate spreadsheet charting on millions of PC users, it has brought to the Mac a charting interface that anticipates most real-life charting requirements. The charts you pick from the 1-2-3 sample gallery look like finished products rather than starting points, and you modify the charts by double-clicking on chart elements and filling in one-element-at-a-time dialog boxes. You don't even need to consult 1-2-3's superior help facility, and you can shrink a set of charts to a set of small icons on your worksheet. This enables you to manage a number of charts conveniently on a single small screen.

All things considered, the graphics prize goes to 1-2-3, mainly because it returns good results for the smallest amount of time invested in both training and actual charting work.

MACROS



	Excel	Resolve	Lotus 1-2-3
computation	✓		
editing/auditing			✓
graphics			✓
macros	✓	✓	
database access			
connectivity			

LOTUS 1-2-3 FOR MACINTOSH'S MACRO language (which is the same as the PC version's) is one of the most widely used programming languages in the world, with millions of users actively writing and debugging code every day. This situation is almost tragic, for two reasons. First, despite being useful, 1-2-3 macros are the least readable and most bug-friendly of modern programming constructs; and second, many macros already available in 1-2-3 turn out to be mere fix-ups for printing, display, or charting inadequacies in the MS-DOS environment.

Macintosh users, for example, are frequently shocked to hear that DOS 1-2-3 users by the millions have shelled out good money for a utility that simply allows a spreadsheet to be printed sideways—a choice available in every Mac application in the Page Setup dialog box. The result of this environment dissimilarity is that not much of the giant body of 1-2-3 macro code will do Macintosh users any good without a serious overhaul.

In a burst of corporate optimism, anticipating defections from Microsoft, Lotus outfitted 1-2-3 with a translator for Excel 2.2 macros. But 1-2-3's cryptic macro notation (can you figure out what */WR* means by looking at it?) and lack of in-worksheet macro-linked buttons (which would make it easy for new users to operate a template) solidly place 1-2-3 in last place as a Mac macro maker.

Excel 3.0's macro code is marginally more congenial than 1-2-3's; offers debugging help in the form of code tracing; pro-

Spreadsheet Speeds

	Open	Save	Insert/Delete	Recalc Plain	Recalc Math	Sort
Excel 3.0	11.3	24.1	17.2	9.4	21.0	8.8
Lotus 1-2-3 Mac	13.3	9.3	10.1	9.8	37.5	12.1
Resolve 1.02	4.0	8.4	19.4	9.6	14.4	15.8

The times reported here are total seconds for each set of tests.

The tests were run on a Macintosh IIfx with 4MB of RAM. The spreadsheet files used for the tests were in native file formats and consisted of 10 fields

with a database of 1200 records; worksheet size was 2 sheets, with 10,000 cells. In all programs the autorecalc and undo features were on.

vides easy editing and convenient single-stepping (see "Making Excel Macros"); and gives ambitious programmers a dialog box editor to make macro-based programs faster to write and more professional-looking.

The option of running macro scripts as add-ins means that code can be integrated automatically into Excel worksheets; you don't have to remember to load macros separately when you use the worksheet. In addition, linkage of macro code to buttons lets programmers make self-explanatory worksheet templates even for complex problems. The profusion of business, science, and personal software in the Heizer Software catalog testifies to the versatility of the Excel macro language as

well as to the high degree of compatibility between Mac and Windows codes.

Resolve employs a macro system that is nearly the same as Wingz's admirable HyperScript—the closest approach to a real programming language ever included in a spreadsheet. It's more English-like than Pascal is, it's easy to read and modify, and it enables you to attach buttons to scripts just by dragging buttons from a palette and running Learn Script for the desired action (see "Writing Your Own Scripts").

For customizing templates to meet your needs, the macro system in Resolve can't be matched. But Resolve isn't really suitable for programming commercial templates because it has no debugging

help or dialog editor, thereby restricting you mostly to shorter projects. Thus, the verdict on macros is a split decision—Excel has the facilities for handling application-size projects, while Resolve is superior for smaller-scale work.

DATABASE ACCESS



	Excel	Resolve	Lotus 1-2-3
computation	✓		
editing/auditing			✓
graphics			✓
macros	✓	✓	
database access			✓
connectivity			✓

SPREADSHEETS COMPARED

	Claris Resolve 1.1	Lotus 1-2-3 for Macintosh	Microsoft Excel 3.0
GENERAL			
Price	\$399	\$495	\$495
Capacity	32K × 32K	256K × 8K × 256K	256K × 16K
Recommended memory with System 6	2MB	2MB	1MB
Recommended memory with System 7	4MB	3MB	2MB
Security/password levels	2	2	1
EDITING AND AUDITING			
Cell notes	●	●	●
In-cell editing	○	●	○
Split screens	○	●	●
3-D worksheets	○	●	○
Between-worksheet links	●	●	●
Cell-reference tracking	●	●	●
Outlining	○	○	●
COMPUTATION			
Number of functions	149	140	146
Matrix math	●	●	●
Array arithmetic	○	○	●
Solver	○	● ¹	● ²
GRAPHICS			
Line, bar, 3-D bar, area, x-y, and pie charts	●	●	●
Wire-frame	●	○	○
Surface	●	○	●
High-low-close	●	●	●
MACROS			
Dialog box editor	○	○	●
Compiler	●	○	○
Number of commands	340	198	276
CONNECTIVITY			
SYLK support	●	○	●
WK1 and WKS support	●	●	● ³
Excel 2.2 import and export	●	●	●
Excel 3.0 import and export	●	● ⁴	●
Data Access Manager support	○	●	●

● = yes; ○ = no. ¹ Solver can handle only a single variable. ² Solver can handle multiple variables and multiple constraints. ³ Also supports WK3. ⁴ Read only.

ALL THREE PRODUCTS ENABLE YOU TO define a data table and perform sorts and searches within the defined area. For many users, this is enough; the database function in Excel is probably the most-used "database application" on the Mac.

There are nonetheless wide differences in database functions among the three spreadsheet programs. Resolve, for example, simply provides a table in which you can perform not-very-fast sorts and searches. Excel offers more, including a query form that enables you to enter search criteria field by field.

1-2-3 has advantages over both its competitors in data handling. The Form view (formatted single-record view) of the database lets you make updates to the data in the spreadsheet table. Besides this, 1-2-3 offers a true relational join, which is a way to combine existing tables to generate new tables with different sets of records and fields. Lotus has done a conscientious design job here; its internal database capabilities set the standard, making 1-2-3 my choice in this category.

CONNECTIVITY



	Excel	Resolve	Lotus 1-2-3
computation	✓		
editing/auditing			✓
graphics			✓
macros	✓	✓	
database access			✓
connectivity	✓		✓

THIS CATEGORY COVERS SEVERAL topics—file-format exchange, System 7 communications, and external database access.

File-format compatibility among the three spreadsheet packages varies. Even

though these are the three leading Mac spreadsheet packages, not all of the programs can read and write files to each of their counterparts, in the way that the top word processors can all share files.

One of the features promised with Resolve 1.1—a new, minor upgrade from version 1.02—is the ability to import and export Excel 3.0 worksheets. (Resolve 1.1 wasn't available at the time of our evaluations but should be shipping when you read this.) Excel can't read Resolve files, and 1-2-3 doesn't include SYLK, which is nearly the universal file-exchange format on the Mac. As a result, to make up files for benchmark testing, I was obliged to use .WKS as the common format.

1-2-3 has a variety of egregious problems importing simple tabbed text. For example, the program doesn't read most tabbed text files correctly. According to Lotus, there are no immediate plans to fix this rather shameful flaw. However, since most users will probably import DOS 1-2-3 files, this problem may not be critical.

1-2-3's cross-platform features include the ability to call up the classic DOS menu by pressing the backslash key (\) (see "3-D or Not 3-D"). For Macintosh users this glimpse of DOS is a historical curiosity; for DOS transplants it means instant access to familiar territory.

Excel's cross-platform credentials are just as solid; the Mac version of Excel is nearly identical to its Windows counterpart (they share several manuals). The odd man out in this comparison is Resolve, a resolutely Mac-only product.

All these products were designed after the System 7 revolution, and all support publish and subscribe and Apple events. 1-2-3 combines its own Data Lens software with Apple's Data Access Manager for importing corporate data from mainframes and minicomputers.

Similarly, Excel tries to combine

Microsoft's Dynamic Data Exchange with Apple events to communicate with external databases. In both 1-2-3 and Excel, Apple events are used to send and receive data messages from other computers, and the software translates the data into a form the spreadsheet can use as a data table.

If your company has a main database that uses SQL as a database query language, rest assured that someone in the company can program 1-2-3 or Excel to download data. Resolve 1.02 merrily ignores the problem, giving no obvious way to communicate with external databases except perhaps by using custom scripts to manipulate System 7's data-access features. (Resolve 1.1, however, promises support for Data Access Manager.)

Excel and 1-2-3 thus find themselves tied in the connectivity category, with Resolve 1.02 basically declining to participate in the competition.

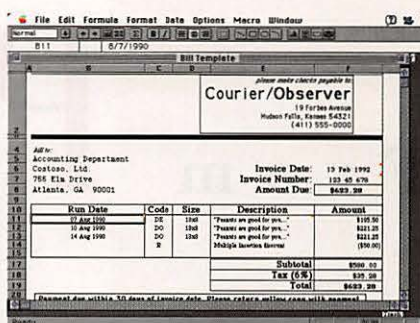
ADDING IT ALL UP

CLARIS PUT A BETTER INTERFACE ON Wingz and renamed it Resolve; the result is a spreadsheet that's miles ahead of Excel 2.2, the program Wingz was designed to beat.

If your Mac sits by itself on a desk with no strange network cabling coming out the back, and if you aren't sure what the difference is between DOS and Windows and no one you work with knows the difference either, then you may be in a position to exploit Resolve's particular strength—you can learn how to use it in 10 minutes and how to customize it in about 20 more. It's easy to picture artists and writers (and executives, for that matter) who would be happy with Resolve and dismayed by other spreadsheets.

The other two products call for substantially more commitment. 1-2-3 is probably going to be the program of choice among those who don't get to make the choice themselves. If you have the lone Mac in an office full of PCs, most likely someone will hand you a copy of 1-2-3 for the Mac and you'll be quite happy with it. It's the best piece of software yet to come from Lotus.

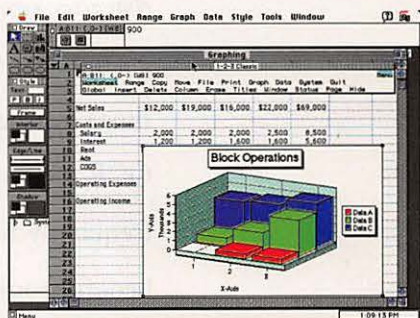
The only problem with 1-2-3 is that there are few problems with Excel. Excel has no important deficiencies, offers lots of scope for the advanced user, is a better numerical computing engine than its competitors, and has been the Mac standard for so long that a vast hinterland of products, books, and training videos has sprung up behind it. Despite creditable efforts by both Claris and Lotus, Excel 3.0 adds up enough firsts, ties, and close sec-



Making Excel Macros Excel's macro language leaves many small conveniences to be desired, but it's sufficiently feature-packed so that you can use it to concoct spreadsheet templates, forms, and applications, such as the templates pictured here.



Writing Your Own Scripts Resolve macros are easy to develop, modify, and attach to buttons on a worksheet. With its simple-to-use macro language, Claris's spreadsheet represents the average user's best hope for doing a bit of programming.



3-D or Not 3-D In one Lotus 1-2-3 screen, you can see a glimpse of the near future (an easy-to-produce 3-D bar chart) and of the distant past (the venerable, cryptic Lotus MS-DOS menu system, which itself is five years older than the Mac).

onds in so many categories that it's *still* the best spreadsheet for the Mac. And judging from what we've seen with a preliminary version of 4.0, Excel's position at the top of the spreadsheet chart seems secure—at least for now. **m**

See *Where to Buy* for contact information.

Contributing editor CHARLES SEITER uses all three spreadsheets to develop scientific applications and to analyze markets for analytical instruments.

MW

EDITORS' CHOICE

Microsoft Excel Although Lotus 1-2-3 won one more category than Excel, on balance Microsoft's spreadsheet program still comes out on top for two reasons: Excel has no important omissions, and it offers wider scope as a computing and programming environment than do 1-2-3 and Resolve. The program's outlining features and goal-seeking solver module make it the best choice for advanced users, and the abundance of books and third-party training materials provides an easy introduction for beginners. **Company:** Microsoft Corporation. **List price:** \$495.

From Page Macworld Lab tests 11 optical character recognition programs for speed and accuracy to Pixel

At a visit to the National Grocers Association convention in Florida earlier this year, George Bush was amazed when he saw a supermarket price scanner successfully decipher a bar-code label. The president was getting a firsthand look at a form of *optical character recognition* (OCR)—that seemingly magical technology that enables computers to read. ☞ OCR isn't magic. Computers have been reading for decades—ever since those misshapen numbers first appeared on the bottom of checks. For our purposes, OCR means scanning pages of hard copy and generating editable text files. Anyone who frequently needs to bridge the gap between the printed page and the Mac stands to benefit from OCR. ☞ But *frequently* is the key word, because OCR can require a big investment. The best OCR programs—Caere Corporation's OmniPage Professional **BY JIM HEID** and Xerox Imaging Systems' AccuText—retail for \$995 and \$799, respectively, and require a 68020- or 030-based Mac with at least 5MB of RAM—and 8MB is preferable for best performance. Programs such as Logitech's CatchWord Pro and OCR Systems' ReadRight for Macintosh sell for much less and run on 68000-based Macs such as the Classic and SE, but they are much less accurate. And they still need several megabytes of memory to deliver acceptable performance. ☞ You'll need a gray-scale and color scanner such as Apple's \$1299 OneScanner or Hewlett-Packard's \$1095 ScanJet IIP, or a black-and-white scanner like Abaton's TranScribe 300 (\$1095) or the Microtek MS-2 (\$1195) (both include the OmniType



OCR program). To save time when scanning page after page, add an automatic document feeder for another few hundred dollars. (Apple's OneScanner doesn't support a document feeder.)

After getting all these components hooked up and working together, you may find that your OCR program isn't very accurate, especially with complex or poor-quality originals. With clean, typographically simple originals, such as business letters, you may see accuracy rates of nearly 100 percent; but when the pages get complex, with multiple columns, sidebars, tightly spaced headlines, and a variety of type sizes, prepare for an onslaught of computer-generated typos.

Lest I paint too bleak a picture, there are some excellent OCR programs, and given clean documents and an experienced operator, these programs can be extremely effective. And there are some economical hardware alternatives that may work well enough for occasional use (see "Reading by Hand").

To determine where today's OCR programs soar and stumble, Macworld Lab tested 11 packages using a variety of documents (see "Rating OCR Programs"). Before looking at how the programs did in each test, let's look at the OCR process and at the kinds of features OCR programs provide.

Six Steps to OCR

A TYPICAL OPTICAL CHARACTER RECOGNITION job has six phases. Each phase

affects the accuracy of the final product and also imposes its own demands on a scanner, an OCR program, and your skill as an OCR operator.

Set up for the scan. At this stage, you specify details such as the scanning resolution and brightness. The OmniPage series, WordScan Plus, and ReadRight also let you choose to retain or discard formatting such as italic or bold type. Some programs can even scan a document containing graphics and save the graphics separately—handy if you're updating an old technical manual containing schematics and diagrams.

Scan the original. An OCR program can't deliver accurate results without a high-quality image. Accuracy plummets if the scan is *skewed* (crooked), or if you've adjusted the brightness of your scan poorly, creating a muddy or washed-out image. An image that is too dark causes problems because characters in the scan tend to touch and the hollow portions of round characters (such as the *e*) tend to fill in. A washed-out image complicates recognition because fine character details are lost. For example, if the top and bottom of an *O* are lost, an OCR program may misread the character as two parentheses—(). (See *Lab Notes* in this issue for more details on OCR scanning.)

A new development addresses the need for a high-quality scan. Hewlett-Packard's AccuPage technology (supported by HP's ScanJet IIc and ScanJet IIp scanners) and Caere's AnyPage tech-

nology (currently supported by Microtek scanners), when used in combination with supporting OCR software, automatically analyze gray-scale scans to find text, and create black-and-white scans with optimum results (see "Bringing Type Out of the Background"). Caere's products currently support both technologies, and Calera's products will support AccuPage by the time you read this.

Most programs support the automatic document feeder (ADF) attachments that are available for many flatbed scanners (but not for Apple's). AccuText, WordScan Plus, WordScan, OmniPage, OmniPage Professional, and ReadRight even allow you to scan double-sided originals: first you run the odd-numbered pages through the ADF, then you scan the even-numbered ones, and these programs automatically put the scanned pages in the correct order.

Select the text to be recognized. If you are scanning a complex multicolumn page, you need to tell the OCR program which columns you want it to recognize and in what order to recognize them. All programs provide a marquee tool that enables you to select the areas, or *zones*, you want to recognize (see "Zoning in Progress"). With Calera's WordScan, you can select only one column at a time—recognizing a multicolumn page means a lot of extra effort.

Instead of manually selecting zones, you might prefer to rely on a program's automatic zoning, or *page decomposition*,

Bringing Type Out of the Background

How does an OCR program recognize hard-to-distinguish type that has been printed against a shaded background? Both Hewlett-Packard's AccuPage and Caere's AnyPage technologies attempt to solve this problem by analyzing a

gray-scale scan of the page and intelligently converting it into a black-and-white bitmap that shows only black type against a white background, providing the sharp edges and clear images necessary for accurate recognition.

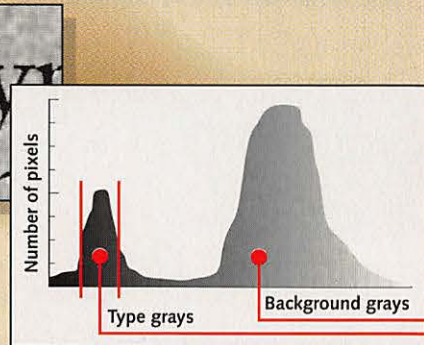
Original color page



Gray-scale scan



Analysis



The page is scanned using a gray-scale scanner. The shaded area at the top of the page is the problem area. If the scanner has been adjusted for the best possible scan of the overall page, the shaded area comes out too dark, obscuring the text.

Both AccuPage and AnyPage divide the scan into small regions and use a variety of image processing techniques to identify the text. One technique, shown here, counts the number of pixels that fall in each of the 256 levels of grays captured by the scan.

In the ideal case, shown here, there are two distinct groupings of gray levels: a clump in the darker grays that represent type, and a larger amount of lighter grays that represent the shaded background. In practice, more-complex analysis must often be done to correctly identify the grays that make up the type and the background.

Reading by Hand

If you can't justify or afford a flatbed scanner's four-figure price tag, you might consider a hand-held scanner such as Caere's \$695 Typist Plus Graphics or Logitech's \$499 ScanMan Model 32. Hand scanners look like huge mice and scan in swaths about 4 inches wide. And therein lies one rub: to scan text columns (or images) wider than the scanner, you must make multiple passes and then use the scanner's *stitching* feature to attach the swaths.

Getting a high-quality scan from a hand scanner is a challenge. You must move the scanner steadily—about 2 inches per second—and not skew the image by tilting the scanner. Scanning a page from a book or magazine is complicated by the binding (the manual for Typist Plus Graphics actually suggests that you tear pages out to scan them). And although the scanners themselves are small, they require external SCSI interfaces and power adapters, so they aren't practical PowerBook companions.

One interesting alternative is Computer Friends' Lightscan 400PS (sold as part of the \$699 Character Scanner package). This two-piece unit works as a hand-held or sheetfed scanner. The scanning portion is 8½ inches wide, and is thus able to scan a letter-size page in one pass. Place the scanner in the included sheet feeder and you can automatically scan up to ten pages. The Lightscan 400PS includes Olduvai's Read-It Pro 3.0. No other OCR programs support the Lightscan, although you can save

Lightscan scans as TIFF files for recognition in a different program.

A hand scanner can be a workable alternative if you usually scan narrow columns or images anyway. Thunderware's LightningScan 400 comes with Olduvai's Read-It Personal, a version of Read-It Pro. Logitech bundles CatchWord Pro with the ScanMan, while Caere's Typist Plus Graphics includes Caere's own OCR software and The Graphic Editor. For OCR work, Caere's Typist Plus Graphics is the best of the bunch. If you scan carefully, you get OmniPage-caliber accuracy. Typist Plus Graphics is also the only package that can insert recognized text directly into an application. Typist Plus Graphics is not Quadra-compatible, but should be by the time you read this.

If you already have a hand scanner, you might consider Prism Enterprises' \$99 ReadingEdge OCR software. It has the same basic features (and, alas, mediocre accuracy) as Prism's TextScan.



Three ways to scan for OCR: the ScanMan Model 32, Lightscan 400PS, and Typist Plus Graphics.

JEANNE STACK

feature, where the program looks for areas of horizontal and vertical white space to differentiate columns and text blocks. But problems can arise. The sidebars and captions in a magazine or newspaper page can wind up interspersed with the main text. Or a program may try to recognize the text in a letterhead when all you want it to recognize is the letter's contents. Or it may try to treat the columns in a table as newspaper-style *snake* columns, recognizing each column

separately from top to bottom instead of reading across each row.

To work around these problems, most programs let you indicate which zones you want to recognize and in what order. Most programs also let you save *templates* that describe the zone boundaries for a specific page layout. This can be a big time-saver if you frequently scan the same page design.

Recognize. This is the main event. When deciphering the bitmapped image

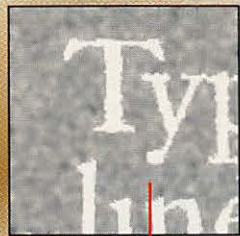
from the scanner, an OCR program employs complex shape-analysis techniques to differentiate the components that make a character unique. AccuText, OmniPage Professional, Read-It Pro, and TextScan also provide *training* features you can use to teach the program to recognize unusual typefaces, special symbols, or defective or poorly scanned characters. There used to be a separate class of programs that required training to read anything other than a small range of sizes and fonts. Today's programs are of the *omnifont* variety, able to recognize a wide range of sizes and fonts.

Some programs offer special recognition options. *Deferred*, or batch, recognition lets you scan a stack of pages but postpone the recognition process until a convenient time—such as after you've gone home. *Background* recognition relies on System 7 or System 6's MultiFinder to let you switch to a different program while recognition occurs behind the scenes. That sounds appealing, but it's practical only if you have a 68020 or later Mac and at least 5MB of memory, preferably 8MB. Even then, your Mac may slow unacceptably as it juggles tasks.

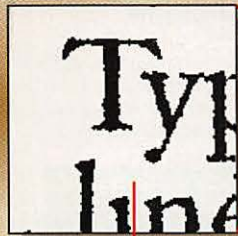
Proofread and polish. All programs except AccuText display recognized text in a window where you can make corrections. Suspicious characters are indicated by a symbol such as an at sign (@) or a tilde (~). (You can specify a different character in case your original happens to contain a raft of at signs or tildes.) By searching for these symbols, you can quickly locate obvious errors.

OCR errors can confound a word processor's spelling checker because they

Adjustment



Background grays



Type grays

Final bitmap



The resulting black-and-white scan of the page is passed to the part of the supporting OCR program that recognizes shapes as letters.

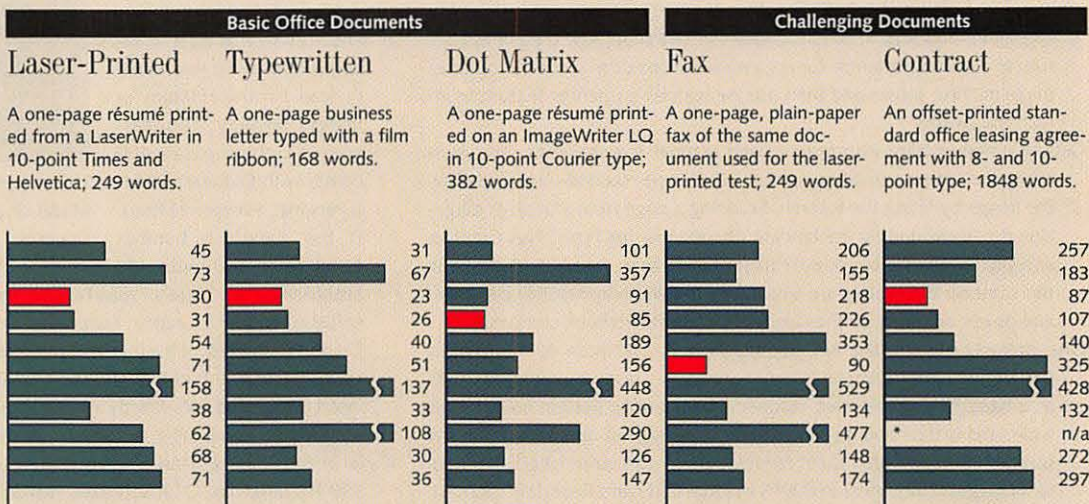
Once the grays that represent the background are identified, they are converted to white, while the grays that represent type are identified and converted to black.

Rating OCR Programs

Performance

Times are in seconds.
Shorter bars are better.

AccuText 3.0
CatchWord Pro 1.0
OmniPage 3.0
OmniPage Professional 2.0
OmniType 1.0
Read-It Pro 3.0
ReadRight for Macintosh 1.0
Recognize 2.0
TextScan 4.0
WordScan 1.0
WordScan Plus 1.0.0



* Did not recognize legal-size page.

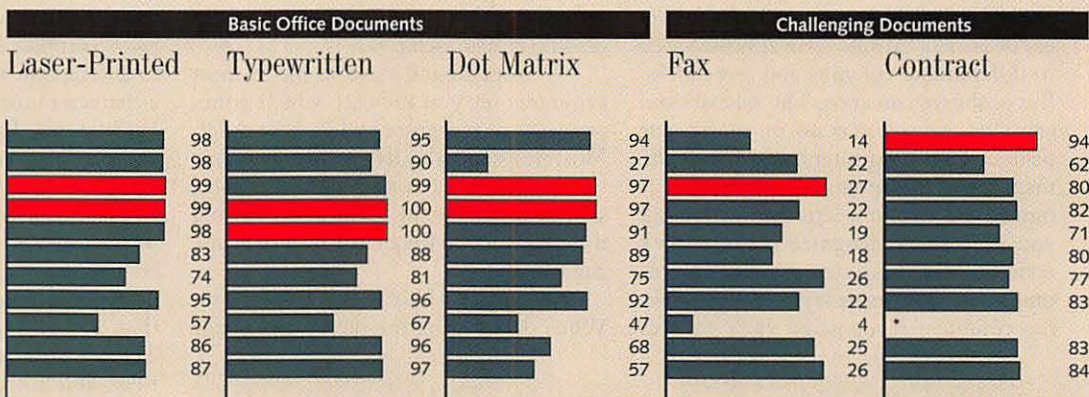
These figures are for recognition time only. The fastest program in each test is highlighted in red. Speedy recognition is always

welcome, but make sure to consult the accuracy figures below to accurately gauge a program's overall effectiveness.

Percent Accuracy

Longer bars are better.

AccuText 3.0
CatchWord Pro 1.0
OmniPage 3.0
OmniPage Professional 2.0
OmniType 1.0
Read-It Pro 3.0
ReadRight for Macintosh 1.0
Recognize 2.0
TextScan 4.0
WordScan 1.0
WordScan Plus 1.0.0



* Did not recognize legal-size page.

The percent accuracy is a helpful number to use when comparing two or more programs' overall efficiency. Look for a program that produces the fewest possible errors on the kinds of documents

that you'll want to scan most often. The most accurate program in each test is highlighted in red. Accuracy results were rounded to the nearest whole number.

Multicolumn Documents

Performance

Although many programs claim the ability to read multicolumn text automatically, we found that the error rates were unacceptable for all programs except OmniPage Professional and OmniPage 3.0, which were able to recognize these multicolumn documents in 30 to 107 seconds. To get acceptable error rates with all the other programs, we had to manually select and order recognition zones on the scanned page. This manual process took 5 to 10 minutes per page for most programs.

Percent Accuracy

Longer bars are better.

AccuText 3.0
CatchWord Pro 1.0
OmniPage 3.0
OmniPage Professional 2.0
OmniType 1.0
Read-It Pro 3.0
ReadRight for Macintosh 1.0
Recognize 2.0
TextScan 4.0
WordScan 1.0
WordScan Plus 1.0.0

Magazine

An article that included headline, subheading, 3 columns of type, a boxed sidebar, and graphic; 552 words.

96
93
99
100
98
93
77
93
78
85
80

Newspaper

An article that included a headline, 4 columns of type, and a pull-quote; 927 words.

96
74
96
98
97
86
78
93
96
70

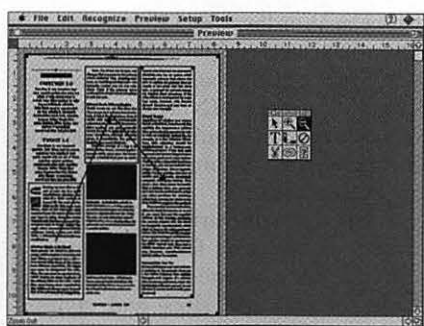
* Could not scan in landscape orientation.

The most accurate program in each test is highlighted in red.

differ from conventional typos. All programs except Recognize, OmniType, and CatchWord Pro also provide spelling checkers geared toward OCR-oriented blunders. Xerox and Caere also sell foreign language dictionaries, and Caere sells medical and legal dictionaries as well.

OmniPage Professional has the best editing features. Besides allowing you to change fonts, sizes, and styles, its editing window has a ruler for specifying alignment and creating and adjusting tabs, margins, and first-line and hanging indents. You can also display the portion of the scanned page's bitmap to manually correct an error. WordScan Plus and AccuText provide a similar feature.

Save the file. Programs that can retain formatting information let you save recognized text in a variety of popular word processor formats. Many programs also support database- and spreadsheet-oriented formats such as SYLK. Recognize, ReadRight, and Read-It Pro also support the Claris XTND file-translation technology. If you have a set of XTND translators such as those sold by DataViz, you can save recognized text in a wide array of Macintosh and PC formats (see *Reviews*, "MacLinkPlus/PC 6.00," *Macworld*, March 1992).



Zoning in Progress Most programs let you specify which zones you want to recognize and in what order. Here three zones have been defined and linked in AccuText. If you used automatic zoning for this page, the figure captions in the middle column would end up in the middle of the text.

AccuText includes a HyperCard stack called AccuStack that lets you import recognized text into a HyperCard stack. A single card can contain an entire document, a page, or even a zone from a page. If you've scanned a mailing list, you can create a stack in which each name and address is on its own card.

Matching the Program to the Job

FOR OVERALL ACCURACY, THE WINNER IS OmniPage Professional. Finishing

first, or tying for first, in five out of the seven tests, OmniPage Professional was the most consistently accurate over a wide variety of documents. OmniPage 3.0 came in second, doing nearly as well as OmniPage Professional, followed by AccuText, which did especially well with the text-laden legal document (contract).

Here's a description of each test along with a list of the top three finishers in each event. (Caere's OmniType was often in the top three, but isn't included here because the program is actually an older version of OmniPage that is not sold, but is bundled with the Abaton Transcribe/300 and Microtek MS-2 scanners.)

The typewritten document was a simple, one-page business letter typed with film and cloth ribbons. The trickiest aspect of recognizing these documents was some occasional underlining, which, because it cut through character descenders, utterly confused TextScan, ReadRight, and ReadIt Pro. Winners: OmniPage 3.0, OmniPage Professional, and WordScan. In these tests, OmniPage Professional (and OmniType) turned in two of the three perfect scores of the entire competition.

The laser-printed document was a one-page résumé containing 10-point

Reading the Future

By the time you read this, Caere will have replaced OmniPage 3.0 with OmniPage Direct. OmniPage Direct will be able to insert recognized text directly into an application—much as Caere's Typist hand-held scanner does now. OmniPage Direct will also support HP's AccuPage technology and, according to Caere, will be more accurate than OmniPage 3.0.

Olduvai is updating Read-It Pro to incorporate an interactive training mode. Read-It Pro 4.0 will also include spelling-checker dictionaries for French, German, Italian, and Spanish, and will allow you to create dictionaries containing your own entries. Version 4.0 will also provide publish and subscribe commands and Apple-events support, and will be able to send scanned text to Claris's MacWrite Pro, Paragon Concepts' Nisus XS, and WordPerfect's WordPerfect 3.0 (none of which were shipping at this writing).

For those who want a stand-alone OCR device that could be used in an office much as a copier is today, UMAX has announced the Readstation, a stand-alone OCR device that includes a 300-dpi monochrome scanner, a PC-format floppy drive, a Motorola 68020 processor, and the OmniPage Professional OCR engine for \$5495. The Readstation is due to ship in May.

One program *Macworld* has tested and liked in previous years was being updated while I was working on this article. TextPert 3.7, from Barcelona-based CTA, will combine full omnifont features with the ability to read 34 languages. And talk about high end: for \$5995, CTA plans to sell TextPert 3.7 with a RISC-based coprocessor board that speeds recognition times dramatically. I tested the board with a prerelease version of the program, and recognition times were more than twice as fast as OmniPage Professional's—very

impressive. TextPert 3.7 will also be available without the board for a reasonable \$495.

At this writing, ExperVision is putting the final touches on a Macintosh version of its TypeReader program, which previously ran only under Microsoft Windows on IBM PCs and compatibles. TypeReader will incorporate ExperVision's Machine-Learned Fragment Analysis technology, which the firm originally developed for the demands of recognizing more than 7000 kanji characters. TypeReader will retain formatting and columnar information, and it will provide a text editor, a pop-up verifier window, a 100,000-word dictionary (medical, legal, and geographic dictionaries will also be available), and a deferred-processing option. The program will also support Hewlett-Packard's AccuPage technology. Final pricing had not been determined at press time; the Windows version retails for \$895.

Perhaps the best news for OCR (and for scanning in general) is that software developers and scanner manufacturers are edging toward a standard set of commands for controlling scanners, video frame grabbers, and other graphic input devices. A new specification, called Twain, will enable software developers to create programs that let you scan both text and graphics directly from within a program.

Some of the Mac developers on the Twain bandwagon include Adobe, Aldus, Caere, Light Source (which develops Ofoto, the scanning software included with Apple's OneScanner), Eastman Kodak Company, and OCR Systems. Participating hardware developers include Hewlett-Packard (its ScanJet IIc and IIp already support Twain), Logitech, Ricoh, and Microtek Lab.

Helvetica and Times fonts. Formatting was more complex than in the typewritten document, with employment dates and employers listed in a two-column format. Winners: OmniPage 3.0, OmniPage Professional, AccuText, and CatchWord.

The dot matrix document, a one-page résumé printed on an ImageWriter LQ in 10-point Courier type, was included in our tests because most OCR programs have trouble with dot matrix output; the relatively crude character shapes are difficult to recognize. Generally, dot matrix output printed in the near-letter-quality mode that many printers provide is easier to recognize than draft-mode output, where the dots that form each character often don't touch each other. Winners: OmniPage Professional, OmniPage 3.0, and AccuText.

The legal document was a one-page contract, offset printed in 8- and 10-point Helvetica, with large passages in all-uppercase letters. Legal-size (8½ by 14 inches) documents impose larger memory requirements, since the larger page size results in a larger scanned bitmap. Winners: AccuText, WordScan Plus, and a tie

between WordScan and Recognize. The OmniPage series didn't do well in this test, turning in accuracy scores of between 71 and 82 percent. (Note that for documents printed in Courier or a similar font, the typewritten document may be a more applicable test.)

The magazine article was one page from a multicolumn feature (from *Scientific American*) printed on glossy paper, with several type sizes and styles, a graphic, a sidebar, and a caption. Many of the programs were unable to automatically recognize multicolumn documents accurately. Instead, we had to manually order recognition zones to get reasonable results. Winners: OmniPage Professional, OmniPage 3.0 (both could automatically recognize complex pages), and AccuText.

The newspaper article was a four-column *New York Times* article with a graphic, a pull quote, and a caption. Text printed on newsprint can be difficult to recognize because newsprint is darker than standard white business paper. And we had the same problems with automatic recognition that we had with the magazine pages. Winners: OmniPage Professional, Word-

Scan, OmniPage 3.0, and AccuText.

The plain-paper fax was a faxed version of the laser-printed résumé used for testing. The results here were disappointing; the best score in this event was OmniPage 3.0's 27 percent—you could almost pound on the keyboard at random and get better results. All OCR developers acknowledge that their wares fall flat with faxes. (Several suggest that you can improve results by transmitting a fax in fine mode if the sending fax supports it. Fine mode doubles a fax's resolution to 200 by 200 dpi; standard resolution is 200 by 100 dpi.) Winners (such as they are): OmniPage 3.0, WordScan Plus and ReadRight (a tie), and WordScan.

Performance

IN OUR TESTS, THE OMNIPAGE SERIES and AccuText were the fastest in the recognition process, although Recognize and the WordScan series were fairly spry, too. With complex documents—the contract and magazine and newspaper articles—the OmniPage series often left AccuText in the dust, but the performance gap wasn't as large with the simpler docu-

OCR FEATURES AT A GLANCE

	AccuText 3.0	CatchWord Pro 1.0	Recognize 2.0	OmniPage 3.0 ¹	OmniPage Professional 2.0
GENERAL					
Company	Xerox Imaging Systems	Logitech	Dest Corporation	Caere Corporation	Caere Corporation
Minimum memory/processor requirements	4MB/68020	2MB/68000	1MB/68000	4MB/68020	5MB/68020
Suggested retail price	\$799	\$399	\$695	\$695	\$995
SCANNING AND SETUP OPTIONS					
Formatting retention	excellent	poor	fair	good	excellent
Graphics extraction	excellent	none	poor	good	excellent
Scanner support	fair	fair	fair	excellent	excellent
Supports automatic document feeder	●	○	●	●	●
Collates double-sided documents	●	○	○	●	●
ZONING AND DECOMPOSITION OPTIONS					
Preview window	excellent	fair	good	good	excellent
Multiple zones per page	●	●	●	●	●
Zoning (automatic/manual)	●/●	●/●	●/●	●/●	●/●
Manual control of zone-recognition order	excellent	good	fair	good	good
Snaking or table column options	●	●	●	●	●
Zone templates	●	○	○	●	●
RECOGNITION OPTIONS					
Deferred batch recognition	●	○	○	○	●
Background recognition	○	●	○	○	○
Recognize from saved image files	●	●	●	●	●
Trainable mode	●	○	○	○	●
Spelling checker	●	○	○	●	●
User dictionaries	●	○	○	●	●
Pop-up bitmap from text-editing window	●	●	○	○	●
TEXT EDITING AND EXPORT					
Text-editing window	none	fair	fair	fair	excellent
Supports Claris XTND	○	○	●	○	○
Supports publish and subscribe	○	○	○	●	●
Supports Apple events	○	○	○	●	●

● = yes; ○ = no; NA = not applicable. ¹ OmniType, a subset of OmniPage, is available only with the Abaton Transcribe/300 and Microtek MS-2 scanners. ² You must have 4MB to use

ments. The least accurate and slowest programs were ReadRight and TextScan.

The Rest of the Story

ACCURACY AND PERFORMANCE RATINGS are important, but they don't reflect a program's design and ease of use. My pick for the best-designed interface goes to OmniPage Professional. Caere's programs have had rough edges in the past (some remain in OmniPage 3.0 and OmniType), but OmniPage Professional is clean and straightforward. The program supports System 7 features, providing publish and subscribe commands and Apple-events support. OmniPage Professional is also the only program that requires System 7.

Caere's OmniPage Professional is the only program that includes a gray-scale image-editing program—The Graphic Editor. It doesn't stack up against programs such as Adobe Photoshop or MicroFrontier's Enhance, but The Graphic Editor is adequate for minor touch-up work.

AccuText finishes second in overall elegance, primarily because the program

lacks a text-editing window. The AccuStack HyperCard-import stack is a nice plus, though, and AccuText's manual is more comprehensive than Caere's (although I like OmniPage Professional's plastic quick-reference card). AccuText does not support as many scanners as does OmniPage Professional. AccuText can't even drive the Apple OneScanner (we had to let AccuText recognize the TIFF file produced from our scans); at press time AccuText had been upgraded to support the OneScanner.

Calera's WordScan and WordScan Plus have adequate manuals, but the programs themselves are awkward. For example, you can't save the document until you close the text window. That's confusing and not the way a Mac program is supposed to work.

Both WordScan programs are also incompatible with the 68040 processor used in the Macintosh Quadra family. (They will run if you disable the 68040's cache, but that slows down the machine.) Calera says 68040-compatible updates should be available by the time you read this, along with support for Hewlett-

MW

EDITORS' CHOICE

OmniPage Professional Excellent overall accuracy, support for a wide variety of scanners, and an elegantly designed interface combine to make this the best OCR program available—provided you use System 7. **Company:** Caere Corporation. **List price:** \$995.

CatchWord Pro CatchWord Pro's straightforward design and support for multiple zones on a page makes it the best choice for 68000-based Macs. **Company:** Logitech. **List price:** \$399.

Typist Plus Graphics Caere's recognition technology makes this hand scanner—OCR combination worth considering if you can live with the limitations. **Company:** Caere Corporation. **List price:** \$695.

Packard's AccuPage technology. But for now, look to Caere or Xerox for a high-end package. (CatchWord Pro also crashes on a Quadra when you use the Export command.)

As for the low end, WordScan 1.0 was usually more accurate than Read-It Professional, CatchWord Pro, or ReadRight, but WordScan 1.0's one-zone-per-page limit may be a serious drawback if you regularly scan documents with complex layouts. The aforementioned low-end packages provide better format retention and zoning features, and are easier to use than WordScan 1.0. You need to weigh those pluses against their inferior accuracy. If you rule out WordScan 1.0, I recommend CatchWord Pro or Read-It Pro. But if you're serious about OCR, consider a high-end program first. It may pay for its extra cost in reduced proofreading and correction time.

New technologies promise to make OCR easier and more versatile, but don't look for 100 percent accuracy any time soon. Making dramatic improvements in accuracy and progressing to handwriting recognition, the most challenging OCR job, may require the kind of processing power that only the next generation of RISC-based computers will bring. Until then, remember that OCR replaces typing, not proofreading. **m**

See *Where to Buy* for contact information.

Contributing editor JIM HEID used OCR when preparing the manuscript for his *Macworld Complete Mac Handbook* (IDG Books Worldwide, 1991), a revised collection of his monthly *Getting Started* columns. He's also the author of *Macworld Guide to Microsoft Word 5* (IDG Books Worldwide, 1992).

Macworld Lab testing supervised by TIM WARNER.

Read-It Pro 3.0	ReadRight for Macintosh 1.0	TextScan 4.0	WordScan 1.0	WordScan Plus 1.0
Olduvai Corporation	OCR Systems	Prism Enterprises	Calera Recognition Systems	Calera Recognition Systems
1MB/68000	4MB/68000	2MB/68000	3MB/68000	3MB/68000
\$595	\$199	\$395	\$295	\$595
poor	good	poor	poor	good
none	good	none	none	good
fair	fair	poor	good	good
●	●	●	●	●
○	●	○	●	●
fair	fair	poor	good	good
●	●	●	○	●
●/●	●/●	○/●	NA/NA	●/●
good	fair	poor	NA	●
●	●	○	○	●
●	●	●	●	●
○ ³	●	limited	●	●
●	○	●	●	●
●	●	●	●	●
●	○	●	○	○
●	●	○	●	●
○ ³	●	●	●	●
○ ³	●	○	○	●
none ¹	fair	fair	fair	fair
●	●	○	○	○
○ ³	○	○	○	○
●	○	○	○	○

Read-It Pro's omnifont features. ³ Read-It Pro 4.0 will provide these features.

Office Home How To

SETTING UP TO WORK AT HOME

MEANS DOING MORE

THAN PUTTING A MAC

ON THE

KITCHEN TABLE

by

Saul D.

Feldman



EACH MORNING, MILLIONS OF PEOPLE slog through bumper-to-bumper rush-hour traffic to get to work while others get to the office by ambling from the bedroom to the den. Some people arrive at the office in expensive clothes while others sit at their desk in pajamas. Some workers get flak from ever-vigilant bosses for arriving late while others work when the spirit moves them.

There are a myriad of home-office occupations, from those you'd expect—like computer consultants, programmers, graphic designers, writers, and newsletter publishers—to other not-so-obvious professions, including private detectives, translators, architects, textile designers, public-relations counsels, occupational-safety consultants, and even services that transmit daily business news via fax.

People start home-based businesses for many reasons. They may be looking for a new challenge or may want to be their own boss. And a growing number of home-based businesses are a result of the troubled economy.

No matter what home-based business you may be contemplating, there are legal, financial, and personal considerations you should be aware of.

Local Laws

SETTING UP AN OFFICE IN YOUR HOME is more than a matter of where to place the furniture and office equipment. Each municipality has its own tax and zoning laws for home-based businesses. You should call your local taxing and zoning

authority to find out what laws affect you.

The laws vary widely. For example, Philadelphia requires every business in the city, whether in a home or office building, to pay a one-time business privilege tax of \$200. The city taxes both your gross receipts and your profits. Atlanta charges an annual fee of \$60 to have an office in your home and levies additional taxes if you have receipts greater than \$3000. San Antonio has no requirements for registration and no taxes for home-based businesses.

Zoning is another potential problem. Calls to several major cities revealed that none prohibit a business in the home, but many have regulations against signs in the window or on the lawn, against many clients coming and going, and against excess noise. Phoenix's ordinances let you have a home office. But you can't have employees working in the home (though you can employ relatives who live with you), use more than 25 percent of your home for business purposes, or use equipment or machinery not typically found in the home (computers are not a problem). San Francisco's laws mirror Phoenix's, but they also prohibit a separate entrance for most businesses.

Federal Income Taxes

"A HOME OFFICE RAISES A RED FLAG for an IRS audit," says Martin Lerner, a San Francisco lawyer. The Internal Revenue Service began cracking down on home-office deductions in 1976 and tightened up considerably last year. Most people who have a home-based business

report income and expenses on Schedule C of the federal Form 1040 tax statement. If you include home-office deductions on Schedule C, you now must itemize these expenses on a new tax form, Form 8829.

Despite increased scrutiny, the home-office deduction is well worth pursuing. You just have to follow the rules scrupulously. In compiling home-office expenses, remember that these expenditures cannot exceed your income.

If you plan to claim a home office on your federal income tax, you must have a dedicated area set aside as a home office. A room that is sometimes an office and sometimes a den won't do. Take care to follow IRS regulations that the room be used "regularly and exclusively."

Deducting insurance is a different issue, says IRS spokesman Larry Wright. You can deduct insurance (the full amount) only if you have a separate rider covering your business. Standard homeowners' or tenants' insurance is not deductible (see "Avoiding an IRS Audit").

One crucial tax issue is how you handle computers and software. Section

179 of the tax code says you may write off \$10,000 in business-related tangible personal property that you purchased in a tax year. This includes computers and office equipment. Alternatively, you may choose to depreciate this same equipment over a five-year period. If you expect to have hardware and other capital expenses over the years, the Section 179 deduction may be more beneficial. If these are one-time expenses, you may be better off using depreciation to spread the tax savings over a five-year period.

If you are using your computer strictly for your home business, there is no problem in claiming it as a business expense. But if it has other uses (personal or recreational), you must be using it at least 51 percent of the time for your business to claim a deduction. The best way to document this is to keep a log of computer usage. This can be either handwritten or a file that you maintain on your Macintosh.

People with home offices are favorite targets for IRS audits. "Returns with home-office deductions get more scrutiny," says James Dingus, an accountant in

Cleveland. According to San Francisco tax lawyers Stephen Moskowitz and Marcus Merchasin, the favorite word of an IRS auditor is *disallowed*.

Moskowitz and Merchasin emphasize that the IRS is a collection agency; it does not set policy or make the law. They claim that taxpayers have a good chance to win in court, but you have to decide if the fight is worth your time and money.

Tax lawyers, accountants, and IRS agents agree on very few issues, but they do concur on one key point: Keep good records of your income and expenses. Keep receipts. Log business expenses. If you use your car for business, keep accurate trip records. This is a great use for a spreadsheet or database.

The record keeping doesn't stop just with income and expenses. Because you have no employer deducting income taxes from your salary on a regular basis, the federal government wants to make sure that it gets its share of your profits on a periodic basis. You have to make quarterly prepayments for both income tax and Social Security, using the 1040ES form.

Workers with a sideline business can avoid this paperwork by increasing their tax withholding at their primary job.

If your estimates are too low and you owe the IRS a lot of money, you may owe a penalty as well; while the rule is complicated, a penalty is likely if you owe at least \$500, what you owe is at least 10 percent of your total tax liability, and you underpaid taxes the previous year.

To avoid this, guess your profits for the year (this gets easier after a couple of years), figure out how much you would be taxed on that (probably 20 to 25 percent for federal taxes), divide that amount by the number of paychecks you get, and have

"Acting is really a small, independent business," says John Delancey, known for his portrayal of the villain Q on the "Star Trek: The Next Generation" series. He uses a Mac Plus and a PowerBook 170 to manage his contracts and residual payments from his Hollywood home office.



MARK HANAUER



your employer withhold the result for each paycheck.

If you are self-employed, you also have no employer contributing to a retirement plan. You can reduce your taxable income by setting up your own retirement fund under the Keogh plan. This is an excellent tax shelter, as well as a sound move for your retirement, but it does involve even more record keeping.

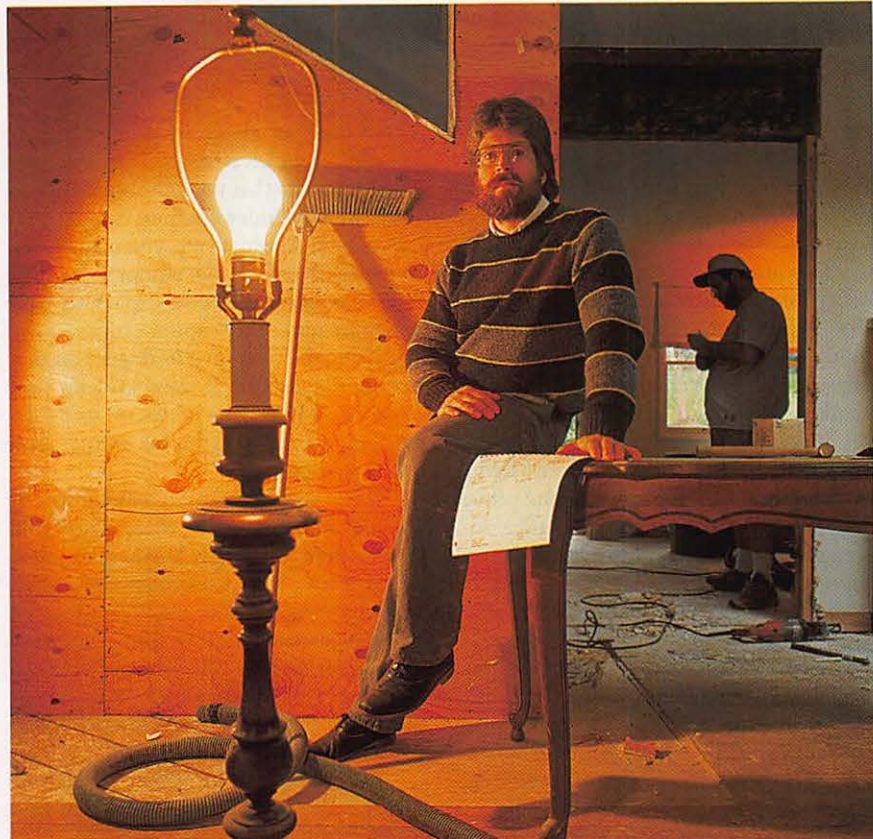
To keep informed on the IRS's latest thinking on home offices, order the free IRS Publication 587, *Business Use of Your Home*. As with all IRS publications, it is available by calling 800/829-3676.

There is also the matter of state and local income taxes. Most state and local tax agencies base their taxes on the adjusted income from your federal tax form, although they may have minor differences in how they let you compute deductions. A few states, like Massachusetts, have their own regulations. Because these vary from place to place, as well as from year to year, be sure to know your local income-tax regulations.

Insurance

INSURANCE IS ANOTHER POTENTIAL minefield for home-office workers. There are two major types of insurance that concern you—health and business.

Most large employers and many small companies offer health insurance as part of their benefits package. But when you are self-employed, you must fend for yourself. Given today's medical costs, you are asking for trouble if you're not in-



With a Mac IIsi and a laser printer, Charles Stembridge (pictured here at a job site) produces architectural drawings for home remodeling and additions out of a converted garage at his home in Walnut Creek, California.

sured. The U.S. Congress's Office of Technology Assessment estimates that almost 19 million Americans have individual health insurance. If you are generally healthy and don't have any medical conditions, you won't have much trouble finding coverage.

You might consider joining a health maintenance organization (HMO), where

doctors' visits and hospitalization are covered for one flat fee. A few years ago, some HMOs were not accepting individual members, but competition today is heating up and many are seeking new enrollees. The Kaiser Foundation Health Plan, with facilities in 16 states, is the nation's largest HMO. About 10 percent of its members are individual members.

Home-Office Tools

Just about every Macintosh office should have at least one good spreadsheet, database, word processing, and telecommunications program. But home offices have specialized needs, both those for your particular type of business and those for the clerical and record-keeping tasks that a support staff would do for you at a traditional office. Of the many home-office products I evaluated, the following stand out as particularly useful and well designed.

Accounting

You are probably not a CPA, and you may have an accountant do your taxes. But on a day-to-day basis, you need to know how much money you have, how much money you owe, how much is owed to you, and how you are spending your money. You need to know whether you are making or losing money.

M.Y.O.B. 2.1 is designed for the small-business owner who is not an accounting expert. You can create a balance sheet, write checks either by hand or with your printer, and do a simple analysis of your business's financial status. M.Y.O.B. also generates customizable invoices and tracks inventory. Several nonaccounting features are extremely useful: you can maintain a to-do list and calendar, track customers, and compute billable time. Well-designed tutorials guide you through the program, and a HyperCard stack teaches basic accounting terms.

Quicken 3.0, the popular financial software program, is less comprehensive but is still a good choice for accounting novices with smaller businesses. You can integrate home and business accounts or keep them separate. Quicken is simple to learn, has extensive financial report capabilities, and doesn't bog you down in accountant-speak. You can pay bills electronically through Quicken's link to Checkfree. When you start up the Macintosh, Quicken's Billminder function automatically notifies you when bills are due. Unfortunately there are no similar ticklers to remind you when money is due you. You also can't generate invoices as you can in M.Y.O.B.

Billing and Logging

Several small-business accounting programs have a billing module, but if you charge clients by the hour, you may need more power. Timeslips III 2.1 keeps track of your billable hours. Each time you begin working for a new client, enter the project and your hourly rate on the program's desk accessory. Click your mouse and the meter begins running. You can transfer the running tally to Timeslips' comprehensive billing features. Your invoices will look good, too, thanks to Timeslips' page-layout module. The Timeslips DA is especially handy if you charge for phone consultations or if you need to document computer usage for an IRS deduction. An optional module links Timeslips' data to major Macintosh accounting programs.

Costs vary by region. For Kaiser, sample family rates are \$299 per month in Northern California and \$351 in the Middle Atlantic states. Depending on the region, the only cost other than medicine is a fee of up to \$5 for each visit. But if you use an HMO, you must use its physicians and its hospital facilities, although you can generally choose from among them.

If you want greater choice of hospitals and physicians, consider a plan like Blue Cross, even though monthly costs are likely to be higher. California's rates are typical for Blue Cross: if you are between 30 and 40 years old and have two children, your monthly payment is \$392. You pay the first \$250 for doctors' bills, and Blue Cross pays 80 percent of the remainder, up to a cap after which Blue Cross pays the full amount of covered services. Depending on the policy, hospitalization costs you between \$250 and \$2000.

Many organizations, such as professional and alumni associations, offer health insurance for their members. In some cases you get a better deal than you could find on your own, but in other cases the costs are greater. Shop around.

If you have a medical problem and seek health insurance, you may have trouble. A report by Citizen Action, a Washington, D.C., public-interest group, notes that, depending on the company, between 8 and 24 percent of all applications for individual insurance were denied. The group also cites an Office of Technology Assessment report stating that 20 percent of individual applicants "received

a substandard risk classification, leading to a pre-existing illness exclusion or above-average premiums."

The other type of insurance you need to consider is for your business itself. Many people with home offices rely on homeowners' or tenants' insurance to cover their office contents against theft, fire, or other damage. Calls to several insurance companies revealed that each has its own way of treating home offices and computers. Some require a separate rider. Others cover computers up to a set amount (usually no more than \$8000). Just as with health insurance, you have to shop around. To avoid problems with future claims, tell your agent that you are running a business from your home.

You can also purchase separate computer owners' insurance. For example, Safeware, an insurance company based in Columbus, Ohio, covers hardware and software in one policy. You pay \$89 each year for \$8000 in coverage, or \$129 for \$14,000. There is a \$50 deductible. Earthquake coverage is extra, a policy change made after the 1989 Loma Prieta quake in the San Francisco Bay Area. The ComputerInsurance Agency, based in Pleasantville, Ohio, charges \$160 for \$8000 in hardware coverage and \$1600 in software coverage. You pay \$280 for \$14,000 in hardware coverage and \$2900 in software coverage. There is a \$50 deductible; earthquake coverage is included.

Lawyer Lerner also recommends that you consider business-interruption insurance and perhaps business-liability insur-



Linda Brown runs a purchasing firm from her home in Seattle, using a Mac to track materials she brokers for shipbuilders and home builders.

ance. Be sure you are covered for personal liability, especially if you have clients come to your home.

Some people believe that they can protect themselves by incorporating, since this sets up the company as a separate legal entity, shielding the individual from claims. Lerner believes that this is generally unnecessary.

Voices of Experience

IF YOU ARE PLANNING TO SET UP A home office, talk to other people who have made this step. They can give you some excellent expert advice.

Social isolation is perhaps the number one complaint of people who work at home: you don't get out of the house to go to work, and you may spend day after

If you need to log just computer use, TimeLog 1.0 couldn't be easier to use. Just place it in the System Folder and TimeLog automatically keeps a record of how you use your Macintosh. It gives you a choice of textual or graphical reports on all programs you used, how long you used them, and the total time the Macintosh was on. Data can be exported to spreadsheets or printed from the program. But be warned: TimeLog reports on all programs you use, including games.

Contact Management

Many people with a home office spend much of their time with a telephone glued to their ear. Contact-management software helps you keep track of these calls. These programs can keep a record of phone numbers, categorize entries (like suppliers, customers, and prospects), dial the phone, log calls, and let you take notes. You can export and import data to and from other programs and print output in forms ranging from labels to pocket address books.

Three excellent contact-management products are worth considering for the phone-based business. TouchBase does all its work from a handy DA. You can even export data to Sharp's Wizard hand-held personal information device and generate custom fax cover sheets. Dynodex includes both a DA and a stand-alone program. Its screen layout is not as well designed as Touch-

Base's, but it does offer easier data entry. Address Book Plus is the most comprehensive of the three, offering detailed phone entries, easy data entry, and a variety of output formats.

All three of these programs do miss one feature. If you charge clients for phone calls, it's essential to have an easy way to track long-distance calls. None of these programs can print a separate report listing all your calls.

Labels and Envelopes

There is a good chance you'll be doing a lot of mailing in your business, both day-to-day correspondence and mass mailings.

MacLabelPro 1.5 is essentially a desktop publisher for labels. With it, you can create professional-looking mailing labels complete with graphics and postal bar codes. (Proposed postal regulations would offer a discount on mail that includes this code.) Although it is no substitute for sophisticated databases, MacLabelPro keeps a record of names and addresses that you can export to other applications.

If you want to print directly onto envelopes, check out MacEnvelope. It offers the same kinds of publishing and printing features as MacLabelPro does but also has guidelines to help you print your envelope to meet finicky postal regulations. An online reference gives you current postage rates and standard postal abbreviations.



day by yourself. Howard Liptzin, a San Francisco private detective, describes the feeling: "The world spins around while I sit alone in my robe and slippers." Liptzin advises, "Examine the issue of how you would feel if you had to stay home for the whole day. If you can't take the isolation, it will be a problem."

Find ways to avoid isolation. Mike Catt, a Dallas entrepreneur, advises people to make it a point to get out of the

house. "The walls can close in on you if you sit at your Macintosh all day," he warns. Getting out does not always involve a major excursion. Charles Stembridge, a building designer in Walnut Creek, California, appreciates "being able to run out and shoot baskets for 15 minutes when I'm facing a creative block on a design I'm working on." Try doing that in a 60-story office building!

Join an association dealing with your

profession and go to its meetings. Online services can also help you feel less alone. CompuServe has an especially good special-interest group (the Work forum) for people with home offices. It's a great place to make contacts.

Penny Gurstein, an assistant professor of urban design at the University of British Columbia, in Vancouver, Canada, studied people with home offices. She believes that while these diversions can help

Avoiding an IRS Audit

Nine years ago, Thomas Cadwallader, a university professor, and his wife, Judy Douglas, a transportation planner, deducted expenses for a home office and a personal computer. It took them five years of learning tax code rules and fighting through the legal system before the U.S. Tax Court allowed the computer deduction. Cadwallader and Douglas are still fighting for the home-office deduction.

Home-office and computer deductions fall into murky areas of the tax laws. Cadwallader and Douglas claimed a deduction for a computer, since both used it for office work. The IRS disallowed the deduction because neither person's employer required the use of computer on the job. But the U.S. Tax Court ruled that to effectively perform their jobs, Cadwallader and Douglas needed a computer. The deduction was allowed.

Cadwallader and Douglas claimed a home-office deduction because Cadwallader didn't have sufficient room at his campus offices to store research materials and he did a lot of writing at home. The IRS said the home office did not qualify because it was not Cadwallader's principal office; the U.S. Tax Court ruled the IRS was too strict but disallowed the deduction anyway on the grounds that the home office was not where Cadwallader accomplished most of his work.

Accountants and the IRS are conservative about deductions. Tax lawyers are less conservative, citing cases like Cadwallader's and Douglas's as evidence that the IRS's policies are overly restrictive and do not stand up in court.

Whether you do your own taxes or not, you need to consider the tax implications of running a home-based business. An error could cost you money or, worse, an audit. Here are some tax tips to keep in mind all year long.

Matching Expenses to IRS Forms

- Keep a running tally of what you pay (including sales tax) for equipment and supplies. A tally helps you determine if you're reaching a deduction limit for business property expenses or if investing in new hardware this year rather than next might ease this year's tax burden.
- Mark what type of expense each item is so it will be easier to figure where to claim each de-

duction. Some expenses are deducted on Form C (Profit or Loss from Business) and others on Schedule 8829 (Business Use of Your Home).

Categories to Track for Schedule C

Business utilities Do not include electricity and heat unless you have separate meters for your office. Include only charges for business phone calls; if you have a separate business phone line, include its base charges.

Supplies This includes consumables such as stationery, pens, printer ribbons, and postage. It also includes software that has a limited life span, such as a tax-preparation or calendar program.

Equipment and business insurance Do not include homeowners' insurance—deduct that in Form 8829.

Business travel

Commissions and fees

Advertising expenses

Other This includes electronic information services and professional dues and publications.

Categories to Track for Form 8829

Rent or mortgage interest and real estate taxes If you rent, list rent in the "Other" line, not in the "Mortgage Interest" line.

Utilities Report only those shared between personal and business quarters, such as electricity and heat. You cannot deduct any part of base phone charges from a personal or shared line.

Insurance Report homeowners' and renters' insurance only.

Home Deduction Warnings

A home office must be used "exclusively and regularly" for business to be eligible for tax deductions. If your employer provides office space, working at home does not qualify you for home-office deductions. If you claim multiple businesses at home, they must all qualify; otherwise, none does. If you run a sideline business, you should be able to prove that you intend to make a profit from it. One IRS guideline for proving this is to be profitable three years out of five. Here are some general guidelines to follow:

- Keep your home office separate from your home's private portion. That means no games

on a business Mac and no rollaway bed in the office. If you have an office in shared space like a den, you must prove the space used for the office is never used for nonoffice purposes (usually by testifying or producing photographs). Violating this strict division can result in all of your home-office deductions being disallowed.

- Deduct mortgage interest for the business portion of your home on Form 8829 and the rest of the interest on Schedule A. (IRS Publication 530 covers the rules for mortgage interest deduction.) If you plan to sell your house, do not deduct a home-office expense for that tax year; otherwise you may be liable for a large capital gains tax.
- Form 8829 deductions cannot exceed your gross income. (You can report a loss from deduction on Schedule C.)
- If your Form 8829 deductions exceed your gross home-business income, you might get more tax relief by deducting your entire mortgage interest as a personal deduction (on Schedule A) than by deducting the personal part on Schedule A and the business part on Form 8829.



ROBERT HOLMGREN

Marcus Merchasin (left) and Stephen Moskowitz, San Francisco-based tax-law experts, advise home-based businesses to take all deductions allowed by law. They argue that the courts are more disposed to "reasonable" claims than the IRS is.

lessen the isolation, "you have to be your own support on a day-to-day basis. You have to have a lot of discipline."

The look and feel of your office can help make it a happy place. Charlotte Anderson-Shea, a Honolulu-based graphic and textile designer, advises, "Make your office comfortable. Make it a place you want to go to."

If your business requires that you meet clients, consider how you'll feel

about having them come to your home. For some, it's a major problem. Tim Ostler, a London architect, notes, "It makes me reluctant to hold business meetings here, as the office is too small and the flat is, well, too domestic, with underwear drying on the radiators." Building designer Stembridge set up his office in his garage. "I've found it helpful to have a separate entrance to my office. It is less disruptive for the rest of the family when someone comes to my office. I don't have to worry about keeping toys and dogs and other messes out of the way," he says.

Separating work from home is a major problem. If you have an office elsewhere, when you leave work, you travel to your home. Not so when your home and office are in the same place. It becomes too easy—especially for a workaholic—to work constantly and do "just one more" thing, when the office is down the hall.

"If you really want to have some home life, keep things as separate as possible," recommends urban-design professor Gurstein. Do all you can to segregate home from work. Keep everything in your office, and don't bring your work to your living space. Try to create physical boundaries that separate your work space from your home. This can also help keep members of the household who work from feeling as if they are simply coming home from one office to another. And Gurstein recommends that you create temporal barriers: keep regular work hours.

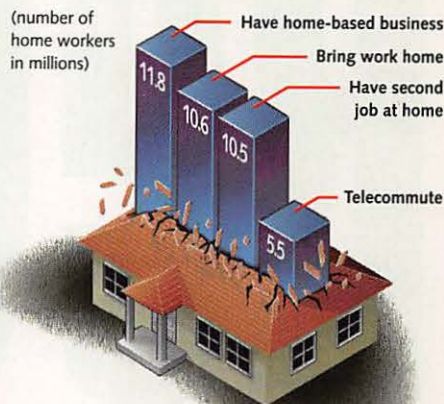
Many people believe strongly that you should have a separate phone line for your business. Not only does this make accounting simpler for tax purposes, but it also maintains your professionalism and helps separate home from work. "A three-year-old's 'Hewwo,' no matter how sweet, doesn't really help convince clients that they are in professional hands," comments building designer Stembridge.

If people know you work at home, you may get phone calls at all hours. There is nothing wrong with letting an answering machine pick up messages when it's inconvenient for you to answer the phone.

A major benefit often touted about working at home is freedom. There are no bosses, no mandatory work hours, and no commuting. But in reality, people who work at home are far from free spirits. "I used to have one boss. Now I have as many bosses as I have clients. It can be frustrating," comments William Koroluk, a technical writer in Ottawa.

Don't minimize financial considerations. You won't have a regular paycheck. Some clients may not pay on time, and some may never pay. Work may come in spurts. If possible, you should have a cash reserve to tide you over the rough spots.

Home-Office Work Styles



More than 38 million Americans did some or all of their work at home in 1991. This figure is expected to rise to 50 million by 1995. Most people who work at home do so on a part-time basis. Those who telecommute (work partly at the office and partly at home for the same job) are mostly employed by large companies and governmental bodies; almost a million telecommuters work at home 35 hours a week or more. About half the people who work at home own a computer and almost 25 percent own more than one.

Source: Link Resources

Home Sweet Home Office

BUT THERE ARE MANY ADVANTAGES to working at home. If you have a home office, you have lower overhead than many of your competitors. You don't have to pay for an expensive office or worry about work clothing. You can take advantage of high technology to do much of the work that used to be handled by a clerical staff. You can set your own hours. Night owls can work until 2 a.m. and get up late. Larks can begin work at 5 a.m. and quit early. You can make your own policies and plan the direction of your business.

If you are starting a home-based business, your major concerns are probably finding clients and doing the work. But you can save yourself a lot of grief by knowing in advance what laws, regulations, and personal considerations will affect your enterprise.

Working at home can be a rewarding experience, both financially and personally. "I enjoy my independence, and I enjoy my home. I think those are the chief prerequisites for someone contemplating a home office," says building designer Stembridge. Textile designer Anderson-Shea sums it up: "Don't apologize for working at home. You're the envy of everyone who drives to the office." ■

See *Where to Buy* for contact information.

SAUL D. FELDMAN is a free-lance writer working from his home office in San Francisco.

Property Deductions

The IRS lets you deduct the cost of tangible property—furniture, computer equipment, vehicles—from your business income. This reduces the property's real cost by 20 to 30 percent, depending on your tax bracket. You can deduct tangible property by depreciation or Section 179 election.

Depreciation means you deduct part of the purchase cost each year, over a period of years. The period depends on the type of property, based on the IRS's view of its useful life. Computers and peripherals have a five-year period. For equipment that you purchase only once every several years, depreciation is a good method because it spreads the tax benefits over several years.

The Section 179 election lets you deduct the full cost of tangible property in the tax year it was purchased, although there is a cap of \$10,000 or your net profit, whichever is less. The immediate tax relief is a great incentive to use the 179 election. Since computer equipment often requires upgrading every year or so, you are likely to have a new property deduction each year.

Selling old property or trading it in for a credit on new property is considered income. If you use depreciation and sell or trade property during its depreciation period, expect headaches in adjusting the depreciation amounts to compensate for the change in depreciation basis—like calculating the current fair-market value.

Some tax accountants say to count software purchases as supplies, but an IRS spokesman said to consider them business property, since software's usefulness covers several years. If you use the Section 179 election, software may make your total purchases surpass the limit, forcing you to use depreciation to deduct some property; you'll get less tax relief and more paperwork.

Warning

Stay in touch with tax rules by reading the IRS publications for each tax form. IRS Publication 587, a guide to home-based businesses, is especially useful. And—especially if you are new to the home-office life—invest in tax-planning books. But remember that, no matter how much you rely on advice, no one but *you* is responsible for your tax decisions.—GALEN GRUMAN

Reviews

IN THIS ISSUE: DiVA VideoShop, LZR 960, PacerForum, SigmaPlot, Cinemation, QuarkXPress, PowerModem, Plots Unlimited, UserLand Frontier, TI microLaser Turbo, and more

Two-Axis Multiple Master Typeface

Myriad

PROS: Breakthrough in electronic font technology; compatible with existing printers; 247,016 possible type styles; ships with new and upgraded typeface utilities. **CONS:** No optical-size axis.

COMPANY: Adobe Systems. **REQUIRES:** Mac Plus; 2MB of RAM; hard drive; PostScript or other AppleTalk printer; System 6. **LIST PRICE:** \$370.



WHEN POSTSCRIPT-GENERATED type debuted in 1985, some hailed it as a revolution in typesetting, others feared it might render their current technology obsolete, and a few isolated curmudgeons dismissed it as inferior to traditional typesetting. They were all correct. Today, the scope of the PostScript language has made it a typesetting standard, as the first group predicted. Its popularity has forced typesetters and commercial printers to upgrade their equipment, as the second group anticipated. But sophisticated desktop publishers have begun to express impatience with the limitations of vector-based fonts. Unless you're willing to use a font editor such as Letraset's FontStudio or Altsys's Fontographer, type outlines are static—scalable but otherwise inflexible. In the pre-electronic days, the best type designers didn't merely create a single outline and call it a *Q*; they created many *Q*s, each optimized for a specific type size and style. A 72-point *Q* offered thin stems and delicate serifs to emphasize



Variations on a B Myriad provides two design axes, four master designs (red), 15 primary fonts (red and dark blue), and as many custom fonts as you see fit to create (light blue).

elegance; a 6-point *Q* featured thick stems and heavy serifs to enhance legibility.

Multiple Master is the combination of several extreme fonts—called *master designs*—which you can blend to create additional fonts. For example, one master design might represent a typeface optimized for 6-point display; another might look best when set to 72-point. Together, these two master designs form a *design axis* called optical size (not available in Myriad), along which you can generate your own custom designs that will function best at 12-point, 14-point, and other whole-number increments. Other possible design axes include weight, to create libraries of incrementally light and bold type styles; width, to condense and expand type to accommodate copy fitting; and

style, to customize the appearance of serifs and other nuances of a typeface.

Myriad Multiple Master ships with 30 styles and empowers you to create more than 200,000 variations, each unique.

Myriad Opportunities

MYRIAD, ADOBE'S 275TH FONT PACKAGE, is the company's flagship Multiple Master font. Like previous PostScript fonts, Myriad includes screen fonts and printer fonts. All fonts are compatible with any Mac and any PostScript printer. (Adobe Type Manager 3.0, included with Myriad, enables the font to print to QuickDraw and other AppleTalk output devices.) Myriad also works with current versions of most screen-font utilities, including Fifth Generation Systems' Suit-

case II and AlSoft's MasterJuggler. If you're running System 6, you can use Apple's Font/DA Mover 3.8 to install Myriad screen fonts in the System file; however, you must turn off MultiFinder.

Myriad's two printer fonts—upright and italic—each contain four sets of master design outlines. The master designs constitute two design axes: weight (from light to black) and width (from condensed to semiextended). For each of the 2 printer fonts, Myriad provides 15 screen fonts, called *primary fonts* (see "Variations on a B"). Each primary font serves as a recommended weight and width that corresponds to a traditional type style.

To distinguish one screen font from another, Adobe uses a fairly complicated naming convention that measures variations in weight and width numerically (see "Myriad Menu").

To create incremental fonts of your own, use the Font Creator utility. Font Creator assigns each design axis its own scroll bar with an accompanying numerical option box. Use the scroll bar or enter a value to specify a custom weight or width within the numerical range defined by the master designs. Then click on the Create button to create your new screen font, which is automatically added to the System file or active Suitcase file. No change is made to the printer font. At about 19K apiece, the custom fonts shown in "Variations on a B" increased the size of my Suitcase file to over 1000K. For this reason, I recommend that you use Suitcase or MasterJuggler in tandem with any Multiple Master font to prevent wear and tear on the System file.

MM Mechanics

NO MATTER HOW MANY CUSTOM fonts you decide to create, the Mac will download at most two printer fonts—Myriad and Myriad Italic—to the printer. The printer fonts are not exceptionally large, roughly 75K apiece, so you do not have to worry about overloading the printer's RAM. Included with each printer font is a new PostScript operator, called MakeBlendedFont. This operator uses the weight and width numbers contained in the screen font name to generate a PostScript dictionary (small, about 4K); that dictionary makes on-the-fly changes to character definitions in the corresponding Myriad printer font. It all happens quickly and without taxing the limitations of your existing PostScript printer. (If you use a non-PostScript output device, the calculations are performed by the Macintosh, which necessarily increases the printing time.)

To use Myriad and the Font Creator utility under System 6 or 7, you have to

install the usual collection of screen and printer fonts, Adobe Type Manager 3.0, and a Multiple Master INIT. If you use Adobe's Type Reunion or Font Downloader, you must upgrade these utilities as well. The absence of an Installer program makes the installation process cumbersome. But once the programs are loaded, I found that they worked in perfect unison. Type Reunion separates primary fonts from Myriad and Myriad Italic into their own submenus (rather than combining plain and italic into the same submenu as you might expect). Font Downloader 5.03 lets you download Multiple Master fonts to a PostScript printer's RAM or hard drive. All utilities are fully compatible with System 7.

Myriad combines the range of options inherent in the Multiple Master technology with elegant execution and functional design (the original work of Adobe type artists Carol Twombly and Robert Slimbach). If I had to find any fault, it would be that Myriad provides no design axis with which to manipulate optical size. Adobe claims that optical sizing is not applicable to Myriad because its regular weight performs equally well at small and large type sizes. Optical sizing will be introduced by the next Multiple Master font, Minion, which will be available by the time you read this. But Myriad exceeds all previous ideas of electronic font perfection. For the design professional, Multiple Master will function as an indispensable type laboratory.

—DEKE MCCLELLAND

Font	
Avant Garde	
Bookman	
Chicago	
Courier	
Geneva	
Helvetica	✓ 215 LT 300 CN
Helvetica Narrow	215 LT 600 NO
Monaco	215 LT 700 SE
Myria MM	400 RG 300 CN
Myria MMIT	400 RG 600 NO
New Century Schlbk	400 RG 700 SE
New York	565 SB 300 CN
Palatino	565 SB 600 NO
Symbol	565 SB 700 SE
Times	700 BD 300 CN
Zapf Chancery	700 BD 600 NO
Zapf Dingbats	700 BD 700 SE
	830 BL 300 CN
	830 BL 600 NO
	830 BL 700 SE

Myriad Menu Included with Myriad, the Adobe Type Reunion utility separates type styles into a hierarchical submenu. The first number in the style name indicates a variation in weight; the second number indicates a variation in width; the letters represent style abbreviations (LT for light, CN for condensed, and so on). At first, the style-naming scheme seems difficult to interpret, but with over 200,000 possible variations, you should expect an additional level of complexity.

Internal Data and Fax Modem

PowerModem

PROS: Internal; fax software easy to use. **CONS:**

Some software bugs; conflicts with AppleTalk Remote Access; no data compression or error correction.

COMPANY: PSI Integration (408/559-8544).

REQUIRES: Mac PowerBook. **LIST PRICE:** \$299.



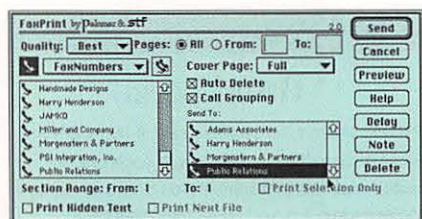
THE POWERMODEM IS AN INTERNAL fax modem for the PowerBook 100, 140, and 170. In data mode, the unit is a 2400-bps modem; it sends and receives faxes at 9600 bps. The PowerModem installs easily into a PowerBook 140 in about 15 minutes. Apple recommends that an internal modem be installed by an authorized service provider; installing it yourself can void the warranty. The average installation fee quoted by several Los Angeles dealers is \$40. Installing the fax software is a simple job; PSI provides an installer program that puts all the fax files in the right folders.

The PowerModem works well as a data modem, downloading files from CompuServe and a local BBS with no difficulties. The data modem lacks MNP Class 4 or V.42 error correction, and also lacks MNP Class 5 and V.42bis data compression. The omission of these features puts the PowerModem at a disadvantage. According to PSI, by the time you read this the company will be offering a new product that includes these features.

The PowerModem's fax software is good. It consists of FaxPrint, a Chooser-level print driver; the FaxStatus and QuickFax DAs; FaxMenu, a control panel; and FaxMonitor, an application. You use FaxPrint for the basic setup, including setting send and receive speeds and coverage information, such as font, phone, and sender's home and return address. The Macro String feature, part of the basic setup, lets you store a calling-card number and then invoke it by including an *M* in the telephone number you are calling. FaxMonitor allows you to edit your fax phone book, size and paste graphics into cover pages, reschedule or delete queued faxes, and access a fax log.

Sending a fax is much like printing to a LaserWriter. You select FaxPrint in the Chooser, then choose Print in the application you're using. You can, however, bypass the Chooser by holding down a modifier key, such as the option key, when you select Print; you set the modifier key using the FaxMenu control panel. You choose the fax destination in a modified

continues



Just Like Printing This modified Print dialog box lets you choose the destination of your faxes and provides several sending options. You drag names of individuals or groups into the Send To box from the scrolling phone-book list on the left. The Delay button holds faxes until a specified time; the Note button lets you add a note to the cover page.

Print dialog box, and click on Send. You can use the FaxStatus DA to report the call's progress.

From the Print dialog box, you can set up new fax addresses and telephone numbers, and save them in your fax phone book. You can send the same fax to multiple destinations, and you can select groups. Choosing a group as the destination automatically sends the fax to all the individuals in the group. If you use the Delay feature, the software will hold all faxes for the time frame you specify, and then send all the faxes for the same destination in one phone call, thus saving toll charges.

Faxes of word processing documents that were sent to a variety of stand-alone fax machines from the PowerModem were clear and readable. As with any fax modem, you achieve the best results with text using Adobe Type Manager or TrueType fonts. Since fax modems are essentially QuickDraw devices, fax output from page-layout programs and PostScript drawing programs such as Adobe Illustrator is likely to be poor.

I was also able to receive faxes with the PowerModem; the unit woke the sleeping PowerBook and saved the incoming fax, which I was then able to read on screen and print to a LaserWriter. I found that the printed copy was much easier to read than the screen version, due to the superior resolution of the LaserWriter over the PowerBook screen.

Problems

THE MOST ANNOYING PROBLEM IS that when the fax software is active, the PowerBook's screen never goes to sleep, although the hard drive's sleep function works correctly. Because the screen's backlighting is the PowerBook's primary power consumer, this problem causes the battery to lose its charge much more quickly than normal. Having the screen on all the time cut down my PowerBook 140's active time from just under 3 hours to 1½ hours.

This sleep mode problem is also of concern when faxes are received by a sleeping PowerBook, or when the PowerBook is set to automatically wake up and send a previously scheduled fax. In both cases, the PowerBook wakes up correctly, but the screen does not go back to sleep mode. Pending a software fix, PSI suggests a workaround whereby you turn the screen backlighting off entirely if you're running on batteries and you leave the PowerBook unattended to send or receive faxes. The fax software, supplied by STF Technologies, is not 32-bit clean, a flaw that causes random crashes when using virtual memory. At press time, PSI stated that its new version would fix the sleep problems and would be 32-bit clean.

There is also a conflict between AppleTalk Remote Access (ARA) and the PowerModem. When ARA is switched on, it completely takes over the modem port, and the fax software cannot gain access to the port. If you set up the PowerModem to be an ARA server, you cannot receive faxes. This problem limits ARA, and it also affects other manufacturers' products. If you frequently use ARA from a PowerBook, you should consider a 9600-bps modem such as Global Village's PowerPort/V.32; using ARA at 2400 bits per second is painfully slow.

The PowerModem is a better unit than the send-only fax modem Apple includes with the PowerBook 170, and the fax software is superior. The PowerModem is not the best choice for people who expect to regularly use AppleTalk Remote Access, or for those who do a lot of online work that requires a high-speed data modem. But if you are a light user of the data-modem features and primarily want to send and receive faxes, the PowerModem is a good addition to your PowerBook.—TOM NEGRINO

Desktop Programming

UserLand Frontier 1.0

PROS: Robust scripting language and Apple-events controller; completely customizable; AppleLink and CompuServe online support. **CONS:** No stand-alone script execution; incomplete documentation; weak telephone support. **COMPANY:** UserLand Software (415/325-5700). **REQUIRES:** Mac II; hard drive; System 7. **LIST PRICE:** \$249.



USERLAND CALLS FRONTIER THE "utility of utilities." It is first and foremost a powerful scripting language called UserTalk. UserTalk includes more than 350 verbs that fall into roughly 30

categories, including file, window, and dialog management; word and outline processing; string handling; and program management. There is also an advanced set of programmer verbs that let you manage resources (an Apple term for part of a program), communicate with other software, browse a network, and even crash your own Mac. Scripts are designed to automate a collection of desktop actions.

Frontier is also a complete development environment. Frontier is tightly integrated with a table-oriented object database. Each table entry can be a simple data type, like a string or an integer. For more complex needs, a table entry can be a script, an outline, a menu bar, a word processing document, or a picture. A table entry can also be another table (up to 25 levels deep), allowing you to create complex, hierarchical data structures.

Frontier also lets you create *agents*—scripts that operate in the background on your system. You can, for instance, create an agent that checks the time every minute and launches a backup script at a specific time of the day. Frontier is also compatible with all forms of Apple's inter-application communication (IAC). You can use Frontier's IAC verbs to control or interact with other programs on your own desktop or across a network.

And Frontier is completely customizable. Frontier menus, which are a special data type, are stored in the object database. You can change most of Frontier's menus by editing the data. Menu commands are based on Frontier scripts, so you can change the operation of any command. The program includes robust word and outline processors for managing text and outline objects, and an interactive debugger for testing scripts.

Frontier is somewhat like HyperCard in that there are different layers for different people. Power users can customize their desktops using Frontier as the command center, or create scripts to automate network-management functions for a group of Macs. Programmers can use Frontier to test IAC-aware software, create prototype applications, and manage their desktops.

The more you delve into Frontier's complexities, the more work you have to do. The program comes with a *User Guide* and a *UserTalk Reference Guide*. Both are excellent for what they cover, but both are incomplete. The *User Guide* glosses over the more complex topics; the *UserTalk Reference Guide* has no explanations of the advanced verbs. Some verbs and key database objects are not explained anywhere.

UserLand does provide the following: First, the object database has a variety of *continues*



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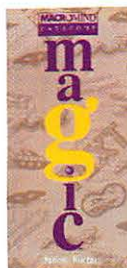
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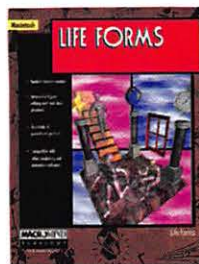
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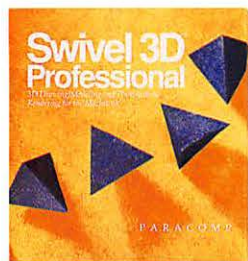
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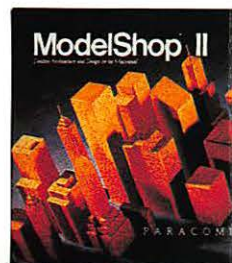


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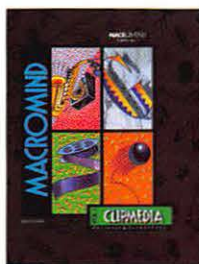
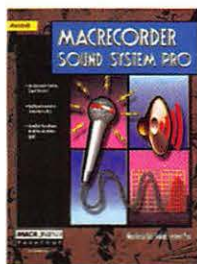
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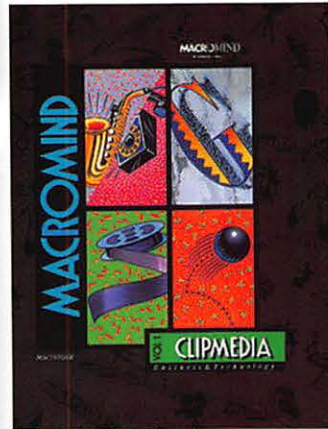
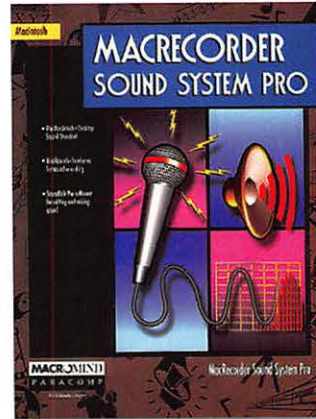
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
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text help files, scattered around at different levels, that explain the contents of the database. Unfortunately, you do not always know the location of these files. You can use the program for hours and still find help files you have never seen before. Second, Frontier comes with another application called DocServer. DocServer, an IAC-aware program that can be controlled from Frontier, lets you search an online help file that contains descriptions of most Frontier verbs. Unfortunately, the help file does not contain information for the advanced verb set. You have to load a separate document describing the advanced verbs and rebuild the DocServer index. But there are inconsistencies between the printed material and the online help.

Overall, Frontier is a powerful, interesting, and complex tool. I've automated a few of my more mundane desktop-management requirements, but my work doesn't involve repetitive tasks that can be easily scripted. I suspect that many typical Macintosh users don't need Frontier, at least not for scripting.

UserTalk is about as complex as HyperTalk but more robust. So if you're willing to learn to write scripts, you can use Frontier to perform routine file maintenance and update a group of networked Macs. You can also use Frontier to integrate a group of IAC-aware applications, such as PageMaker 4.2, Excel 3.0, and QuicKeys², for repetitive data-management tasks. You can automate certain desktop functions to change a group of file names, eliminate old Microsoft Word temporary files, or change the creator type for a group of files. You can use the program to automate complex software testing functions. These tasks just scratch the surface of Frontier's capabilities.

Unfortunately, Frontier doesn't let you create double-clickable scripts. And if you write a script that is to be used by a group of people, you must also provide users with their own copy of Frontier. Although UserLand does provide substan-

tial volume discounts, outfitting a network can be expensive. But these are minor flaws in a ground-breaking product.

—STEVE MANN

PostScript Level 2 Printer

TI microLaser Turbo

PROS: Compact size; can automatically switch between a Mac and a PC on a network; modest processing-speed gains over nonturbo models.

CONS: Higher-price PostScript Level 2 technology yields few discernible benefits; paper-tray software unusable with Turbo models; Turbo board incompatible with some printer drivers.

COMPANY: Texas Instruments (817/774-6001).

REQUIRES: System 6.0.2; LaserWriter driver 5.2.

LIST PRICE: \$2349 (includes AppleTalk board).



THE TI MICROLASER TURBO IS AN enhanced version of Texas Instruments' dependable and appealingly compact TI microLaser Plus printer. As its name implies, the turbocharged TI handles PostScript printing faster than its nonturbo cousins, but its overall performance leaves you wondering whether the extra \$500 you pay for turbo power is really worth it.

From the outside, the new Turbo is identical to standard microLaser models. Its nearly cubical design is solid and compact. It is less than 11 inches tall, has a desk footprint of just 13.4 inches by 14.2 inches, and can nestle into crowded work spaces. A flush-mounted 250-sheet paper tray slides snugly into the front of the printer, and the S-shape paper path turns pages out facedown on top of the unit. Alternatively, heavier stock (up to 36-pound) can be fed straight through to a somewhat flimsy extendable tray that folds out from the back and can hold up to 30 pages. Two slots on the left side of the unit accept optional HP font and emulation boards. Like the other printers in the microLaser family, the Turbo produces fine-quality 300-dpi print.

This newest microLaser incorporates Adobe's PostScript Level 2 technology. Level 2's features are supposed to improve memory management and reduce processing times, but truth be told, the upgrade offers few discernible benefits to the average monochrome page-printer user. What's more, many of the Turbo's most important features are significant only if the printer is used with a PC or shared by PCs and Macs over a network. The 275-page printer manual devotes fewer than 5 pages to using the printer with a Macintosh.

The Turbo has been furnished with a Weitek 8220 RISC processor—a special processor that greatly speeds page-description tasks.

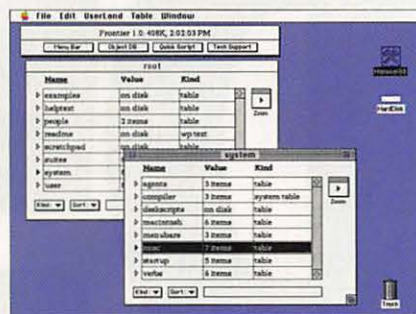
TI promises its new RISC-based controller can deliver up to a sixfold increase in printing speed. The key words here are *up to*; don't expect blistering speeds on every print job. On simple text documents, the Turbo printed only about 40 percent faster than the non-Turbo microLaser. Several time-saving PostScript Level 2 features, such as compression and decompression of large bitmapped files and form and pattern caching, simply don't work unless the printer is paired with a Level 2 printer driver—and none was available for the Turbo when I tested it. Without the Level 2 driver, only a fraction of the more significant Level 2 features are tapped. TI said a Level 2 driver would begin shipping this summer.

While the Turbo's PostScript interpreter is faster than that found in a non-Turbo microLaser, it's equipped with the same 9-pages-per-minute Sharp JX 9500 print engine used in TI's less expensive models. This means that the Turbo can process complex PostScript information more rapidly, but even at its maximum speed it can't push out pages any faster. If you are looking for super speed and you've got the money, consider the microLaser PS35 XL (\$3249) or the Turbo XL (\$3749), both rated at 16 ppm.

To a degree, the TI microLaser Turbo's cutting-edge PostScript technology is a liability. The Turbo board does not always work with current applications that use their own printer drivers, such as Aldus PageMaker. You have to override the PageMaker driver and use the standard LaserWriter driver (by holding down the option key while choosing Print from the File menu) in order for the printer to work.

In fact, not even the current version of TI's own software, Paper Tray Manager, is Level 2-compatible. Paper Tray Manager allows you to switch between the standard and optional paper trays during print jobs and automatically shift orientation for envelopes. TI has promised a Level 2 version of Paper Tray Manager by July, but meanwhile, Turbo owners have been missing out on some of the printer's best hardware features.

Setting up the Turbo is a clean and simple process that involves installing three separate disposable cartridges of toner, developer, and OPC (organic photo conductor). In addition, a cleaning pad and waste-toner bottle must be snapped into place before printing for the first time. Toner cartridges are rated to



Frontier Windows This figure shows the Frontier main window and the first two levels of the object database. Clicking on a table entry opens a window to the next object level.

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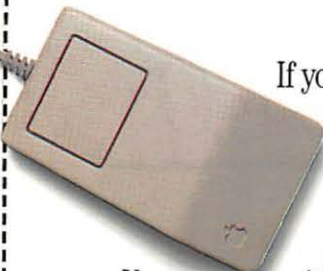
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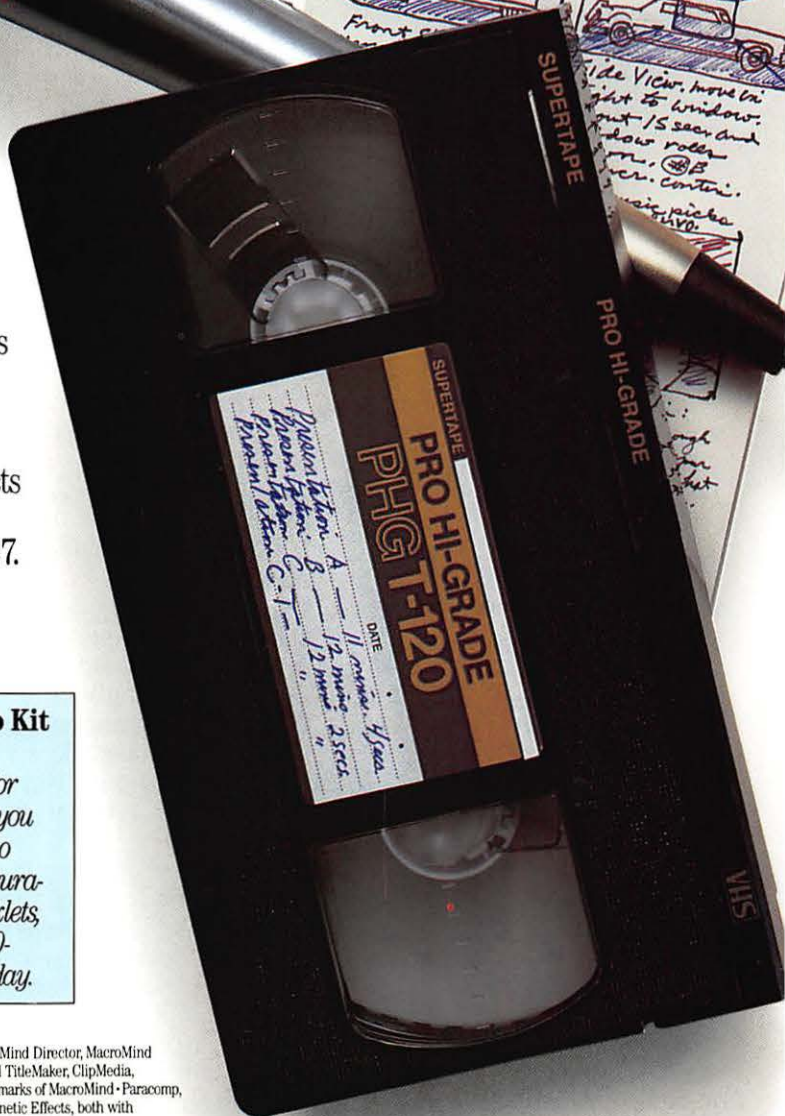
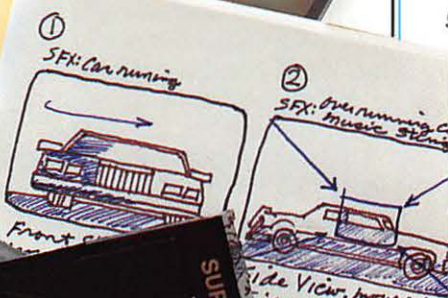
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Then a developer asked, "If I'm using *Macromind Director*™ to do an animation, how do I do QuickTime?"

Many questions like these are being stimulated by QuickTime, Apple's new multimedia technology for the Macintosh.

Put simply, QuickTime defines a new data format for "time based" information (video, animation, music, etc.) and a standard compression scheme to save processing time and disk space.

To end users, QuickTime means that multimedia will be coming to their screens in new, inventive ways. To developers, it means it's definitely time to do QuickTime—or fall behind as the standard takes hold.

How to get into Movies

Actually, as long as your favorite multimedia authoring tool supports QuickTime, creating a QuickTime Movie is as easy as a "Cut and Paste." (A "Movie" is Apple's term for integrated time-based data.)

Take, for example, the *Director* animation the developer asked about at the seminar.

To create such an animation, simply continue to use *Director* like always. You then can add music and digitized sounds that you've sampled and edited with *MacRecorder*™ *SoundSystem*™ Pro.

Or spice things up further by popping a *ClipMedia*™ disk into a CD-ROM player and grabbing a QuickTime video clip.

Using *Director*, you synchronize the audio-visual elements. Then, instead of saving it in the normal *Director* file format, just export your production as a QuickTime Movie.

And that's it. You've just created a QuickTime Movie ready for play-

back in any QuickTime compatible application.

You can play back the Movie within *Director* itself. Or within an entry-level multimedia tool such as *Magic*™.

You can even import standalone Movies into end user apps—to spice up a spreadsheet, for example. Or to make your message very clear in your E-mail. Or to add extra impact to a word processing document.

Now showing on Windows

QuickTime is great for the Macintosh, but what if you need to play back a production on one of the world's 9 million Windows®-based computers?

If you're using *Director*, moving a Mac-based production to Windows is fairly easy.

You simply save your production in the standard *Director* format and use a package such as *Windows Player*™ to convert it for playback.

Your original Mac-based production can now be distributed and played back under Windows, complete with color, sound and interactivity. (A similar *Player* product is also available for playing *Director* productions on Silicon Graphics Iris Workstations.)

Of course, the *other* way to end up on Windows is to start there in the first place.

Take *Action!*™, the easy-to-use, Windows-based package for busy professionals. *Action!* helps you create dynamic business presentations that—unlike static packages such as *PowerPoint*® and *Persuasion*™—contain the power and persuasion of motion and sound.

By presenting with *Action!* and a portable PC, you get the added

impact of interactive multimedia—and do away with the hassles of overheads and slides.

Choices

Today, especially with the introduction of QuickTime, multimedia means many things, including "multi-platform."



Creating a QuickTime Movie with Director 3.1 is as simple as exporting your production.



On Windows, Action! brings the power of motion and sound to business presentations.

You can create QuickTime Movies on the Macintosh.

You can author productions on the Mac, convert them to another format, and play them back on other platforms. Or create presentations directly on Windows.

The choice is yours.



last for approximately 3000 pages. The replacement cost for all three cartridges runs about \$19.80 per 1000 pages.

With the optional AppleTalk board installed, the Turbo's default configuration is Mac-compatible, so all you have to do is connect an AppleTalk cable (not included), plug in the power supply, and you're ready to print. The standard Turbo comes with 2.5MB of memory (expandable to 10.5MB) and 35 PostScript fonts. A disk of screen fonts and a free copy of Adobe Type Manager are also included.

Using the printer with PCs as well as Macs, the Turbo automatically switches between the unit's PostScript interpreter and its built-in HP LaserJet series II emulator. Also noteworthy is its ability to monitor up to three communications ports (parallel, serial, and AppleTalk) simultaneously, switching to the active port. For enhanced PC-connectivity, Epson, Diablo, and Proprinter emulation boards are available for \$135 each. Remember, though, that the Turbo board only affects the processing speed of PostScript.

Other options include a SCSI interface for connecting a hard drive to store downloadable fonts (\$249); a second 250-sheet paper tray, which fits underneath the unit (\$275); and a 40-envelope feeder (\$275). HP font boards run from \$135 to \$399.

Like TI's earlier microLaser versions, the reasonably priced Turbo is an admirable performer and a dependable machine. But unless you plan to use the PC-oriented features, you might want to save some money and stick with the nonturbo microLaser Plus PS 35. The \$500 you pay to get turbo power buys some modest speed gains, but it also gets you the same 9-ppm print engine; the same 300-by-300-dpi resolution; and a PostScript upgrade, the true significance of which has yet to be defined.—JOSEPH SCHORR

Page-Layout Software

QuarkXPress 3.1

PROS: Feature-laden; improved interface; stable.

CONS: Boxes selected with Content tool hide other elements; styles often override local formatting; trapping not fully professional. **COMPANY:** Quark (303/894-8888). **REQUIRES:** Mac Plus; 2MB of RAM (4MB of RAM for System 7); hard drive with 3.5MB of free space. **LIST PRICE:** \$895.



THE LATEST VERSION OF QUARKXPress, 3.1, adds dozens of new features that address almost all of the reservations I've had about previous versions,

including the instability of those versions. It still crashes a bit more often than PageMaker, but I've yet to have this version corrupt a file.

The interface is much improved, with three new palettes (for creating, editing, and applying styles, colors, and traps), better zooming, accurate rulers, more control over guides, a Picture Preview check box in the import dialog box that lets you see graphics before you import them, lots of new preferences, and the ability to see objects while you're moving them.

That last feature does more to improve QuarkXPress's utility for designers than any other: you can now see objects while you move, scale, rotate, and crop them, rather than just seeing the bounding boxes.

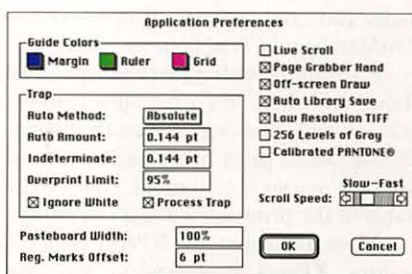
QuarkXPress 3.1 lets you handle layered items much more easily. By \mathbb{H} -option-shift-clicking you can select items that are behind other items, and holding down the option key changes the Bring to Front and Send to Back menu items to Bring Forward and Send Backward. So you can move items a layer at a time.

Zooming is improved in two ways. When you go to Fit in Window view, QuarkXPress centers the current page in the window. When you zoom to a numeric percentage, it centers the currently selected object(s) in the window. These seemingly minor changes speed up production (and alleviate frustration) more than almost any other new feature. Another frustration reliever: you can grab guides anywhere on the page, rather than having to scroll over to the margins. You can also remove all horizontal or vertical guides by option-clicking on the rulers.

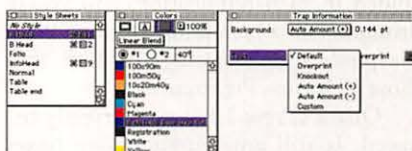
New preferences (some of which appeared in the Freebies package of XTensions for 3.0) include color guides, live scrolling (with constant screen redraw), adjustable scrolling speed, automatic saving of libraries, adjustable pasteboard width, calibration of Pantone color output, and positioning of registration marks (see "What's Your Preference?").

Improvements

TEXT EDITING AND FORMATTING have significant improvements, including the ability to search for the first occurrence of an item; three new types of tab stops (aligning with the right indent, aligning on a comma, and aligning on a specified character); proper alignment of decimal-tabbed figures, even if they are followed by parentheses or superscript letters for footnotes; an enhanced hyphenation routine (*academy* and *electromechanical* now hyphenate properly, for instance), and kerning and tracking limits of up to 500 units (a unit is $1/200$ of an em).



What's Your Preference? There are dozens of preference settings in QuarkXPress 3.1, starting with the Application Preferences dialog box, shown here.



Style and Substance The new palettes in QuarkXPress 3.1 make it much easier to apply colors, styles, and trap preferences.

The new automatic ligature feature combines ligature pairs (*fi* and *fl*, for instance), printing one special ligature character from the font instead of printing two closely kerned characters. Remarkably, when letterspacing increases to a certain point (due to kerning, tracking, justification, or whatever), QuarkXPress breaks the ligature into separate characters. It also breaks apart the ligature to check spelling. Very clever.

You can now load fonts without closing documents, and QuarkXPress updates both the active font list and any open publications. Styles (still called Style Sheets) haven't changed much, unfortunately, aside from the styles palette. QuarkXPress still generally wipes out local formatting when you apply a style.

The Colors palette is a big improvement, and other new color features let you do things you couldn't do before. You can create color blends—for instance, a blend from magenta to cyan—within a frame. You can even blend from a process color to a spot color—something you'd be hard put to do in other programs.

Version 3.1's traps palette, though perhaps useful only to a small percentage of users, shows the most change from version 3.0. You can specify trap attributes for each object (rather than for each color, as in 3.0), and there's Absolute as well as Proportional trapping (so automatic trap overlaps are all the same size, rather than varying in proportion to the difference between the two abutting colors). The trapping is still not perfect, but a careful user can handle many trapping situations.

Other color improvements include support for files in OPI (Open Prepress Interface), CMYK TIFF, and Scitex for-

mats, and color specification using the TruMatch and FocolTone systems.

Printing is what QuarkXPress is all about, and there are a few new features here, as well. You can print master pages, choose not to print blank pages, control whether output is calibrated, and see the status of the print job while it's printing.

More important, the XPress Data file is now XPress Preferences, and you no longer need to include it with your QuarkXPress publications. Kerning, tracking, and other information is included in each publication, and you're prompted for which information to use if the publication's settings conflict with those in XPress Preferences.

QuarkXPress 3.1 is not perfectly behaved. It still annoyingly makes boxes opaque when they're selected with the Content tool; the relationship of styles to local formatting is still confusing and confused; the trapping controls don't let you do everything you need to do; and redraw speed is not blazing (and you can't interrupt redrawing—one of PageMaker 4.2's best new features). But these failings are not fatal flaws. QuarkXPress 3.1 has emerged as a full-featured, stable, well-designed program, with hardly a strike against it. If I were buying a page-makeup program today for the first time, I would buy QuarkXPress.—STEVE ROTH

Telecommunications Software

MicroPhone II 4.0

PROS: Heavy-duty scripting features; supports many System 7 features; customizable interface. **CONS:** Poorly implemented balloon help; lacks useful modules for Loran interface. **COMPANY:** Software Ventures Corporation (510/644-3232). **REQUIRES:** Mac Plus; System 6.0. Recommended: Hard drive. **LIST PRICE:** \$295.



THE LATEST RELEASE OF MICROPHONE II, version 4.0, has a little something for everyone.

All in all, this is not a dramatic upgrade to the product, but refinements are evident throughout MicroPhone's well-designed interface. Most menus and dialog boxes have been streamlined. Instead of choosing the baud rate from 20 radio buttons, you now select it with a single pop-up menu. An improved file-transfer setup routine saves you the trouble of shifting to a second dialog box to adjust settings associated with each of the six transfer protocols the program supports. Most of the dialog boxes can be moved around anywhere on the screen. You have



MicroPhone's Terminal Window Buttons linked to scripts appear on the gray icon bar, positioned here horizontally below the window. Text and background colors are customized via the Terminal dialog box.

the option of a flashing or steady cursor in the main terminal window. And you now can customize the screen using any color on the standard Macintosh color wheel. Fonts are still limited to either 9-point or 12-point Monaco, however.

Other noteworthy new features include four new terminal emulations; an improved Preferences dialog box that lets you choose a default-settings document to open automatically whenever you launch the program; the ability to open and edit several scripts simultaneously; and options for sending incoming data directly to a printer. Version 4.0 also supports HyperCard 2.0 XCMDs and XFCNs.

One of the most highly touted new features in MicroPhone II is an interface document called Loran, which stands for Long Range Navigator. Loran is supposed to greatly simplify telecommunications by providing users with a single interface, or front end, that connects to any number of online services. Instead of issuing commands on networks such as GENie and CompuServe, or on a bulletin board service, you just tell Loran what information you want to send or receive and it handles the rest—logging on, performing whatever tasks you assign it, and hanging up. The system is a telecommunist's dream.

But don't get too excited—yet. Software Ventures describes Loran as “a peek at the future of telecommunications,” and for now, a peek is all you get. Loran's capabilities are limited to sending electronic mail to and from CompuServe and Software Ventures' own bulletin board. The company expects to start releasing additional Loran modules before the year is out. These will automatically handle news retrieval, bulletin board messaging, and other online tasks. By the time you read this, the company should have guidelines to send to users who want to write their own Loran scripts.

For the present, MicroPhone's greatest strength is its scripting facility. The script language is powerful, but it's sur-

prisingly easy to learn, thanks to the point-and-click approach to script building. The Watch Me feature records commands as you perform them and neatly translates your clicks and keystrokes into a basic script. When you choose commands from the Script Command menu, MicroPhone prompts for the proper syntax and argument to complete the expression and automatically checks for syntax errors when you save your work. Working with scripts has been made even easier with the inclusion of the Script Manager, a window that provides a listing of all scripts you have created as well as buttons that let you copy, modify, delete, import, export, or run existing scripts.

Once you've created a script, you can invoke it with a keyboard command or assign it to an icon that will appear on an icon bar that floats across the program's main window. The icon bar is scrollable, so it can hold as many script icons as you please, and you can resize it and orient it horizontally or vertically.

The MicroPhone manuals provide good sample scripts and thorough (though sometimes technically complex) explanations of each script command and function. The script language takes a little experimentation, but I found it fairly easy to grasp and useful for automating many telecom routines.

But it's disappointing to find that the program offers such poor help features. MicroPhone's balloon help offers only the most basic—and sometimes useless—information (for example, pointing to “Modify Service” under the Phone menu produces a balloon that says “Modifies a Service”). The help feature doesn't explain any of the terms that a newcomer to telecommunications will find unfamiliar. Also, the balloon help isn't available at all in dialog boxes, where expressions like “CRC Type” and “Resurrect Transfers” are sure to raise a few questions. Better online help is definitely needed.

The program is only slightly bigger than the previous version—767K instead of 567K. If you install the full complement of scripts for online services (scripts for GENie, CompuServe, and the Software Ventures BBS are included) and the Loran document, the MicroPhone folder takes up about 2.5MB on your hard drive.

But not everyone needs MicroPhone's \$295 worth of sophistication. If you want to create your own electronic BBS, do heavy-duty scripting, or design custom interfaces, you'll find everything you need here. But if you plan to use your modem to dial up a few of the popular online services and little else, less-expensive software will do the job—though without MicroPhone's polish.—JOSEPH SCHORR

DiVA VideoShop 1.0

PROS: Continuous, immediate display of movie in progress; excellent frame-specific navigation features; multiple tracks can play side by side; handles every stage of production from recording through presentation. **CONS:** Unpolished; tools don't work consistently in all modes; insufficient, error-ridden manual.

COMPANY: DiVA Corporation (617/491-4147).

REQUIRES: Mac II (also runs on LC); 4MB of RAM, hard drive with 40MB of free space; System 7. Recommended: 8MB of RAM; 16-bit monitor.

LIST PRICE: \$595.



ALL RIGHT, YOU'VE BEEN BITTEN by the QuickTime desktop movie-making bug. You bought your VideoSpigot, or your RasterOps digitizing board, so that you can convert VHS tapes into digital movies on a color Mac. Now you have to edit this stuff: mix sound tracks, superimpose credits, and fade out at the end. Right now, two programs exist that can help. There's Goliath—otherwise known as Premiere, which Adobe got from SuperMac. And now, slingshot in hand, there's VideoShop.

DiVA, the six-person company that created this upstart, has bigger plans for your QuickTime movies than Premiere does. Both programs are competent as editing programs—they let you apply Photoshop filters, create fancy transitional effects from one scene to another, make cuts and splices, mix multiple sound tracks, and so on.

But the VideoShop experience begins before the editing; with the proper driver software (called a VDIG, available for most digitizing boards, including the VideoSpigot), you can record directly from a camcorder or VCR into VideoShop. Because the program is integrally knit into HyperCard (a fact played down by DiVA), installing a finished movie into a stack of your own is as simple as dragging its icon there.

The Video Desktop

WHEN YOU LAUNCH VIDEOSHOP, A funny thing happens to your desktop. You can still see your drive and folder icons, but all your files disappear except for QuickTime movies. These appear as jumbo icons; after being processed by VideoShop, each QuickTime icon becomes easily identifiable because it shows the first frame of the movie.

There is a simple beauty to this filing system: as far as your brain knows, you're still in the Finder. Use the Find

command. Double-click on a folder to open it. Double-click on a movie icon to play it at full size. Yet you can't drag something to the Trash, rename an icon, or copy anything.

To assemble your movie, you drag icons from their folders on the "video desktop" and drop them into the Sequencer window—empty horizontal tracks, for video and audio. Voilà: instant storyboard. Rearrange scenes by dragging icons. Add another video track and drag it above the first one—VideoShop superimposes them, which is how you overlay titles and graphics (and how, if you're an animator, you could create your own *Who Framed Roger Rabbit?*).

With a double-click, the storyboard expands to show you the actual frames of your movie (or every other frame, or every tenth, or whatever) laid out like a filmstrip. Here editing is intuitive and easy, because you can select frames for editing by dragging through them.

Show Me

BY FAR THE MOST IMPORTANT AND impressive feature of VideoShop, however, is the immediacy of playback. You can put the playback window anywhere you want it to be and make it as big as you want it to be (in any shape)—although on my Mac IIcx, a larger window meant jerkier playback and more sound drop-outs. You can play back any chunk of a movie at any time. You can control playback from the keyboard. And you can even "scrub" to find a specific moment by dragging a handle left or right; you hear the sound (and see the video) play backward or forward as you do so. This critical facet of VideoShop stands in stark contrast with Premiere, where you never get to see your movie-in-progress until you compile it into a Preview.

You can even have multiple video tracks playing side by side within a single playback window. You could create an on-screen "video wall" presentation, with images popping in and out of different places on the screen, all perfectly synchronized.

Better still, the playback window is intimately tied to the Sequencer window, where you do the actual editing. Double-click on a frame in one window to jump to that frame in the other. These scrolling shortcuts (and several dozen others) make navigation effortless—or at least more so than with Premiere, which offers only a single scroll bar (with no numeric readout) by way of navigation.

Trade-Off Derby

HOW PROFOUNDLY DOES DAVID trounce Goliath? Premiere is light-years



The Shop Is Open In the lower right, you can see some open folders in VideoShop's pseudo-Finder; to edit a QuickTime movie, just drag its icon into a track in the Sequencer window (top). (The movie icons shown are some of the excellent clip-movies on the ImageBank CD ROM that comes with VideoShop.) In the lower video track of the Sequencer window, the footage fades in from black. At lower left is the resizable, reshapable playback window. You can see the effects of two video tracks being superimposed—one containing video, the other containing a title that was created in a drawing program.

easier to learn; each of VideoShop's five tools (arrow, hand, scissors, magnifying glass, and eyedropper) works only in certain modes, yet they're never dimmed to show you when they're unavailable. Other minor disappointments lurk: applying a transition takes several minutes; the Delete Clip... command gives you no warning (as is implied by the ellipsis) before nuking footage; and the horribly sparse, mistake-sopped manual is maddening. DiVA promises that a new, improved manual is in the works.

Unfortunately, you're left completely in the dark about how to work with movies you've drag-installed in HyperCard stacks. There they sit: several movies on the same card, playing over and over again. In its efforts to dissociate its product from HyperCard, DiVA withholds any instruction for controlling playback, customizing a movie's appearance, or just *stopping* the darned things from looping endlessly over again. The one thing the manual *does* tell you, alas, is that these aren't stand-alone stacks; they have to reside on a system with VideoShop.

Still, the importance and grace of VideoShop's instantaneous, universal playback can't be overemphasized. Likewise, it seems natural and intuitive to select specific frames for editing simply by dragging through them. The video desktop takes a day to get used to, but it means you never have to open or import any raw QuickTime footage. VideoShop's ambitious, effective, creativity-conducive design deserves four stars—but I'm holding one star in escrow until an updated version wipes away the rough edges, lousy manual, and clumsy interface issues that occasionally dampen the joy.

—DAVID POGUE

Spelling Checker and Thesaurus

Thunder 7 1.0.5

PROS: Universal, fast, automatic corrections; customizable dictionaries; user-definable shortcuts. **CONS:** Questionable suggestions.

COMPANY: Baseline Publishing (901/682-9676).

REQUIRES: Mac Plus; System 6.0.4. Recommended: 2.5MB of RAM; hard drive. **LIST PRICE:** version 1.0.6 \$99.95.



MOST WORD PROCESSORS include a spelling checker, so why pay for a stand-alone alternative? Because it works everywhere you enter text, watching patiently, then pointing out possible errors, helping you avoid embarrassing mistakes.

Thunder 7 is a cdev with an INIT component. In the Control Panel, you designate which dictionary (50,000 words or 86,000) and thesaurus to use. Optional scientific/engineering, legal, and medical dictionaries are available for \$19.95 each. You can specify the applications and DAs in which Thunder 7 is to be active (each application can have a custom set of dictionaries). When Thunder 7 is active, a check mark appears at the right end of the menu bar. You can make selections from this menu,

or use user-definable \mathbb{H} -key shortcuts.

In interactive mode, Thunder 7 watches as you work, analyzing every keystroke for misspellings, duplicate words, and incorrect capitalization and/or punctuation. If it sees something suspect, Thunder 7 beeps. You can either ignore the possible error, fix it manually, or press \mathbb{H} -equal sign (=) for suggested alternatives. Double-click on the replacement you want or press its corresponding number, and Thunder 7 stops searching, returns to the document, and makes the change, leaving all other text alone.

If Thunder 7 fails to give an acceptable suggestion, enter your own word, and before replacing, see if it appears in the open dictionaries. If your word is correct but doesn't appear, you can add it to a custom dictionary. Add it to a glossary, and the next time you type that suspect word, the program backs up and corrects it.

In document mode, you copy text to the Clipboard, then press \mathbb{H} -backslash (\) for the Check Selection window. Each suspected error is highlighted in context, and suggestions appear automatically or on demand. As in the interactive mode, you can choose from the list of suggestions or enter a word of your own. A Statistics option in document mode analyzes the selection and calculates the reading level, and the number of characters, words, syllables, sentences, and paragraphs. After the entire selection

has been checked, you can paste the corrected text back into the original document or leave it on the Clipboard. Baseline supplies compatibility modules for 16 applications and claims full interactive compatibility with all programs that don't modify the use of the Clipboard. Corrected text retains all graphics, styles, and formats. The batch mode functions as a global search-and-replace module. You create a list of words to change, such as replacing each *Mac* with *Macintosh*, then apply this list to your file.

Thunder 7 is a spelling checker, not a dictionary on disk. Still, it comes with a Merriam-Webster thesaurus containing 40,000 words with definitions. When you look up a word, Thunder 7 displays a brief meaning, as well as synonyms and antonyms. You can delve into the related words, or simply replace the word in the document with the one you double-click on.

The best thing about Thunder 7 is how quickly and transparently the interactive mode worked in all the programs I tested it with. My biggest complaints are that it sometimes fails to come up with suggestions for obvious mistakes (*significantly*), lets non-existent words slip by (*trict*), and falsely flags correct words (*performance*). Its speed, customization, and features set are admirable, but before you can trust Thunder 7 implicitly, it needs a dictionary with greater integrity.—OWEN W. LINZMAYER

Scientific Graphing System

SigmaPlot 4.11

PROS: Complete set of math transformations of data; appropriate assortment of graph types; good publication tools; dozens of example files.

CONS: File import problems; intermittent crashes. **COMPANY:** Jandel Scientific (415/924-8640).

REQUIRES: Mac Plus; 2MB of RAM; hard drive. **LIST PRICE:** \$495.



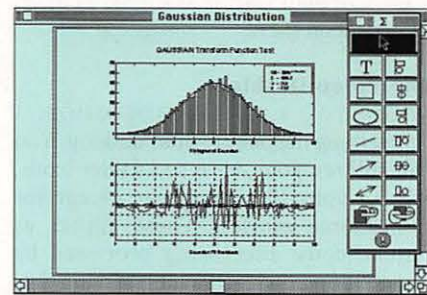
IF YOU'RE FAMILIAR WITH DELTA-Point's DeltaGraph Professional or have seen the charting capabilities of Excel 4.0, you might at first think the collection of graphs in SigmaPlot is somewhat skimpy. While presentation charting packages now routinely offer such dramatic effects as 3-D charts with variable lighting and shading effects, SigmaPlot doesn't offer any 3-D capabilities at all. The graph types (bar, histogram, boxplot, pie, needle plot, scatter, line) offered, however, are just the presentation graph types that appeal to a particular audience: the editors of scientific journals. You might not be able to get gradient shading, but you can adjust styles of axis tick marks and grids, insert axis breaks, add all sorts of graphics and labels, and fine-tune position-

ing of axes and axes elements to satisfy the most meticulous style requirements of professional journals. SigmaPlot's strength is not just that it prepares attractive graphs for publication, but that it provides a complete repertoire of functions, transforms, and programming constructs for matching data to math formulas. The program lets you lay out multiple graphs on the same page, and the manual includes pages of definitive advice on optimizing laser-printer hard copy.

But it's the set of functions for curve fitting and data transformation that makes SigmaPlot worth the money. Besides the expected linear and polynomial regression and splines, you can formulate curve fits to arbitrary mathematical representations. As a simple example, you can fit a Gaussian curve to supposedly normally distributed data and save the residuals for inspection. In fact, SigmaPlot has enough statistical functionality to handle ANOVA and t-tests—for analyzing most experiments so that you probably won't need a separate statistics program. Although the curve-fitting procedures use a language that's at least as complex as FORTRAN, an actual curve-fitting session proceeds through a few simple dialog boxes. The manual on transforms and curve fitting is a model of clarity, and details the computational algorithms used by the program.

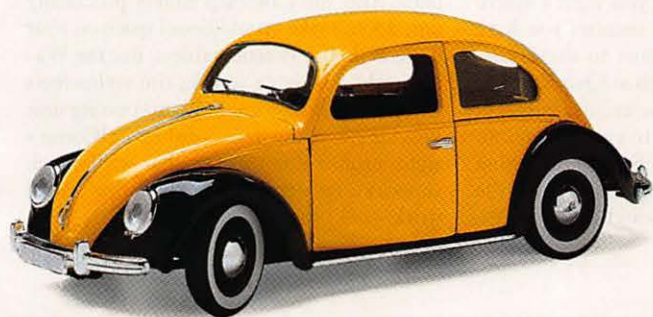
SigmaPlot for the Mac, strong as it is, needs some polish on Mac fundamentals.

The first two versions have been almost whimsically incompetent at importing Excel files (tabbed text becomes the preferred medium of exchange), and the program seems to lock up every few hours under Systems 6 or 7 with equal probability. Undoubtedly these infelicities will be amended anon, but someone at Jandel should have flagged at least the Excel problem (the Windows version, curiously, imports Excel Windows files properly). Despite these glitches, SigmaPlot is a program every experimental scientist needs. It offers unique analytical capabilities in a relatively easy-to-use format, and a short path from raw data to publishable graphs.—CHARLES SEITER



Normal, Right? One of the distinctions between SigmaPlot and a presentation graphics package can be seen here—a data set is compared for normal distribution to a Gaussian curve, and differences are plotted in a journal-quality graph.

EVERY ONCE IN A WHILE, THERE'S A VALUE OF HISTORIC PROPORTIONS.



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1992 GCC BLP ELITE: \$1,399

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End user circle 221 on reader service card

Digitizing Tablets

DrawingBoard II and DrawingPad

PROS: Transparent artwork cover, double-function button on side of stylus; pressure-sensitive pen nib. **CONS:** Difficult to assign macro buttons and switch functions; hard to use side button; understaffed tech support; DrawingPad has no off switch. **COMPANY:** CalComp (714/821-2000). **REQUIRES:** Mac Classic; System 6.0.5. **LIST PRICE:** 12-by-12-inch DrawingBoard II \$645; DrawingPad \$395.



COMPARED WITH THE BARE-BONES Wacom tablet, the DrawingPad and DrawingBoard II tablets offer two extras. The first is a transparent, hinged cover for securing artwork and sketches that you intend to trace. The second is a menu strip with buttons for changing drawing modes and accessing macros. The pressure-sensitive stylus offers a double-function side button to which you can assign tasks. For example, you might select tools by pressing the lower side of the button, double-click by pressing the upper side of the button, and draw with the pressure-sensitive nib.

A cdev (or control panel for System 7

users) allows you to change the way the tablet and stylus operate. As with most tablet cdevs, you can choose between absolute and relative tracking. Both modes are available from the menu strip.

You can rotate the orientation of the tablet with respect to the screen. For example, by rotating the orientation 90 degrees counterclockwise, you map the right side of the tablet to the top of the screen, the top of the tablet to the left side of the screen, and so on. You can also adjust the ratio of the active area of the tablet to one or more screens. For example, if you're tracing a small image, you might map the boundaries of the image across the entire screen so that tracing a small segment represents a long stroke inside your paint program. You can even toggle between two ratios.

The cdev provides options for assigning functions to the macro buttons on the tablet's menu strip. Unfortunately, these options could have been better implemented. For example, to assign a macro, you press the keystrokes that you want a macro button to perform. This assumes you have previously assigned macros to these keystrokes using a utility such as QuickKeys² or Tempo II. Ironically, these utilities intercept the keystrokes as you try to enter them into DrawingBoard II's cdev. So you must first turn off the macro utility, then enter the keystrokes into the DrawingBoard II cdev,

and finally reactivate the macro program.

Even though you can assign keystrokes, mouse clicks, double-clicks, or mode toggle, putting the stylus's side buttons to work is another matter entirely. If the pen nib so much as touches the tablet when you press the side button, the tablet reacts unpredictably. To get the keystroke, you have to float the stylus above the tablet—but not too high or the tablet won't track the stylus—and press the lower side of the button, a decidedly unnatural technique.

CalComp's technical support is also a frustration. I always had to leave a message with an operator—there's no voice mail—and wait for a representative to return my call. Four of my messages were never returned. When someone did call, the person was courteous but generally not well versed on the Mac. In fact, I was able to acquire satisfactory support only after expressing my frustration to a public relations rep.

The CalComp tablets cost several hundred dollars less than their Wacom counterparts. Also, the CalComp tablets' processing unit doesn't take up additional space on your desk, as do the Wacom tablets. But the Wacom tablet is more stylish; the stylus feels better in your hand; and the processing unit provides an off switch. Neither CalComp's stylus problems nor its less-than-stellar tech support are debilitating, but they need work.—DEKE MCCLELLAND

Printer-Driver Software

BetterWriters 1.0.1

PROS: Enhances draft-mode printing; LaserWriter feature emulation. **CONS:** No AppleTalk support; incompatible with some major applications. **COMPANY:** GDT Softworks (604/291-9121). **REQUIRES:** Mac Plus; System 6.0.2; compatible printer. **LIST PRICE:** \$69.



MY FRIENDS CALL ME A GEAR-head, accusing me of always needing to have the latest thing. Well, I don't have a laser printer; just the old ImageWriter II that I bought with my Mac Plus and that I usually keep hidden away in the closet. Fortunately, GDT Softworks has developed its BetterWriters series, a package of Quick-Draw printer drivers for those of us who have not joined the laser revolution.

The \$69 BetterWriters package contains substitute drivers for the ImageWriter I, ImageWriter II, ImageWriter LQ, StyleWriter, and DeskWriter. You simply install in the System Folder the driver appropriate for your printer, select it in the Chooser, and start printing.

The first thing you notice is that BetterWriters offers more quality options than

Apple's standard driver does. On an ImageWriter you have the choice of Best, Fair, Fast, Draft High, Draft Mid, and Draft Low. The three draft modes offer the best printing speed and also some of BetterWriters' strongest features.

The BetterWriters drivers offer a variety of options for making draft output more presentable. With Apple's drivers, draft-mode text is not kerned because the software defaults to the ImageWriter's resident monospaced fonts. GDT Softworks includes a screen font called ImagePro that enables the ImageWriter's proportionally spaced fonts. Choosing the Tall Adjusted and Fractional Widths options (under Page Setup) produces Draft High text that is fully presentable, and it is twice as fast as Best mode.

The drivers support a number of non-standard paper sizes and allow you to specify custom paper sizes for those odd-size forms and labels. Support for TrueType, Adobe Type Manager, and color round out the package's features. The package supports network communication through Shiva's NetSerial and similar products, but does not support AppleTalk.

BetterWriters performs some of the printing gymnastics that laser printers do, such as inverting images and flipping them horizontally and vertically. You can also elect to print only even or odd pages, which

is convenient for printing double-sided pages. Reduction and enlargement are available from 10 percent to 400 percent in 1 percent increments.

The BetterWriters drivers won't turn an ImageWriter into a desktop publishing house. The ImageWriter is still limited by the low resolution inherent in a dot matrix printer, and the BetterWriters drivers don't interpret PostScript, as Custom Applications' Freedom of Press series does. However, GDT Softworks has implemented good gray-scale pattern-matching in the higher-quality settings that definitely enhances graphics output.

The only problems with BetterWriters are some minor incompatibilities with common applications including Microsoft Word, Aldus PageMaker, and QuarkXPress. To GDT's credit, these problems are documented in the manual's appendix, and some are remedied by simply disabling one or two of BetterWriters' features.

BetterWriters is a solid product. For roughly \$1800 less than the price of a new laser printer, you can have significantly better-looking output from an ImageWriter, DeskWriter, or StyleWriter, along with added performance features. I know I'm not the only one in the Mac community who's not rushing toward the latest and greatest. Kudos to GDT Softworks for supporting us.—GEORGE L. REYNOLDS

Coming soon to a screen near you.



Out of memory.

OK

If you think the only way to avoid running out of memory is to avoid running a couple of your favorite applications, think again.

Think about all those memory-hogging fonts and sounds you've got stuffed into that bulging System File.

Then do what over 200,000 resourceful Mac users do every day.

Instead of closing your applications, open a Suitcase.™

Suitcase is the award-winning utility that lets you park your growing collection of fonts, DAs, FKEYs and sounds *outside* the System File.

Thereby giving you the maximum amount of memory for running more applications, building bigger documents and doing other useful things.

What's more, Suitcase compresses your screen font and sound files by up to 60%.

Thereby giving you that much more precious disk space to work with.

It even lets you put your screen and printer fonts on a server for all to share.

Thereby making each disk on the network that much more spacious.

The more resources you have—and the more organized you are—the more memory and disk space you'll save.

But whether your dividends are measured in megs or merely in Ks, Suitcase is guaranteed to save you gigabytes of aggravation.



Even if you're operating in System 7.

Because System 7 still stuffs your resources into your System File.

And System 7 still makes you close down all your applications and restart your Mac each time you install a new font.

Which is a real pain in the, uh, system.

Suitcase, on the other hand, gives you unlimited access to all your resources.

And total control over how you organize them.

Each suitcase can pack up to 800 fonts, 64 DAs, and any number of FKEYs and sounds.

You can group suitcases into sets, then summon all the luggage that

Can't remember the difference between Versailles and Monaco? Not to worry. Suitcase displays your typefaces right in the menu.

belongs with a particular project at the click of a mouse.

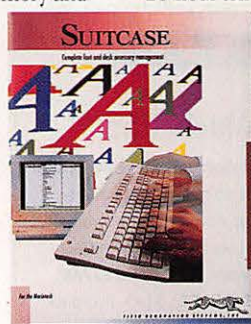
Tips are optional. But here's one for those of you who find font ID conflicts even more irritating than running out of memory.

Get Suitcase. It eliminates them. Call us at 1-800-477-8212.

We'll tell you about our vaunted 24-hour toll-free technical support.

We'll also tell you that Suitcase is backed by a one-year money-back guarantee.

So you can be sure this baggage will live up to its claims.



FIFTH GENERATION SYSTEMS, INC

Circle 135 on reader service card

Educational Exploration Game

Spelunx and the Caves of Mr. Seudo

PROS: Imaginative; appeals to wide range of ages; full of surprises; educational. **CONS:** Minor bugs; some features don't work on monochrome Macs; copy protected. **COMPANY:** Brøderbund Software (415/382-4400). **REQUIRES:** Mac Plus; 2MB of RAM (4MB for color system running System 7); hard drive; System 6.0.7. **LIST PRICE:** \$49.95.



ROBYN AND RAND MILLER, THE creators of *The Manhole* and *Cosmic Osmo*, must have devised a way to digitize the human imagination. With *Spelunx and the Caves of Mr. Seudo*, they've brought us another interactive hyperworld that's packed with rich graphics, entertaining sounds, creative learning activities, and unanticipated giggles. Like its two predecessors, *Spelunx* is certain to charm kids of all ages.

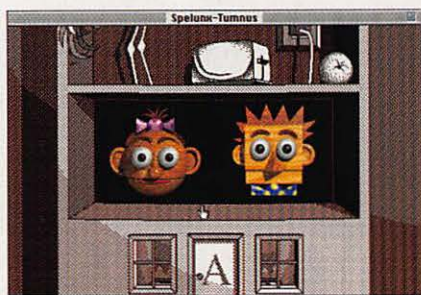
Spelunx is a scholarly teddy bear and the creator of a magical underground kingdom named after himself. His friend Mr. Seudo helped develop the wacky toys and inventions in the kingdom. You never meet either character as you point and click your way

through the game's tunnels and rooms, but you come to know them through their amazing creations.

The caves contain more than 20 of these creations, including a Seudo Scope, which lets you change the spin of planets as you view them (you first select coordinates on a graphing machine); an animator for designing and storing icon-based movies; a Tree Gene-o-rator that produces custom tree seedlings; a tiny farm populated by slightly intelligent ants; and a programmable polka dancer who dances to musical sequences you create. Any of these inventions could capture a child's attention and imagination.

Among my software testers, 8-year-old Anna Marie loved the polka dancer and the tree machine, while 11-year-old Johanna spent hours drawing pictures and playing the arcade-like "catch the toast" game. Andy, who's 12, dubbed the surprise-filled desk drawers "awesome." And 14-year-old Ben explored everything and then used the game editor to add passages to the maze that links the four rooms. Each kid found different ways to play, to learn, and to explore.

Unlike earlier games by the Rand brothers, *Spelunx and the Caves of Mr. Seudo* supplements the black-and-white HyperCard graphics with flashy color animated sequences. The color animation is a big plus if you have the equipment for it and a minor frustration if you don't. If you use



Talking Heads The Pinehead Puppets open their mouths when you click on them; if you speak into the Mac's microphone, they lip-synch your words.

a Classic, an SE, or a Plus, you're likely to get annoying error messages occasionally.

We encountered error messages even on our color IICI when we used the game editor. The editor, accessible only to those who decipher a code with the manual, allows you to customize *Spelunx's* maze, but not its rooms. The manual implies that other rooms might be available in the future. In all likelihood, the tiny bugs in this first edition of *Spelunx* will be removed by then.

Bugs or not, the testing team loved *Spelunx* and the *Caves of Mr. Seudo*. It's fun, it's educational, and it's open-ended. Brøderbund recommends *Spelunx* for children ages five and up. We recommend it for everybody.—GEORGE BEEKMAN AND THE SHOEBEDOOP SOFTWARE TESTING TEAM

Computer Usage Recorders

TimeLog 1.01

PROS: Powerful reporting options; tracks both program and file use; inactive time can be allocated to inactivity or the current file. **CONS:** No network features; no option to combine times. **COMPANY:** Coral Research. **REQUIRES:** Mac Plus; System 6.0. **LIST PRICE:** \$97; five-pack \$340; ten-pack \$630.



WindoWatch 1.52

PROS: Flexible configuration options; network support. **CONS:** Log entries do not list dates or creator programs; limited log-viewing options; cannot automatically allocate pauses to current window. **COMPANY:** ASD Software. **REQUIRES:** Mac Plus; System 6.0.4. **LIST PRICE:** \$149; five-pack \$449; ten-pack \$749.



TIMELOG AND WINDOWWATCH ARE two utilities for recording program-use data. Both enable you to determine the most popular programs in an organization, track time spent on projects, distinguish business from personal use, and decide what seldom-used programs or files to discard.

TimeLog's cdev lets you specify a maximum size for the tracking file, specify the minimum time interval before *TimeLog* considers the Mac to be inactive, decide how to account for periods of inactivity, and designate a hot key to produce an instant Most Active Files report from inside any program.

Report styles include a history chart, showing the dates and times each file or program was used; a comparative-use table, displaying usage graphically or numerically; and a list of total usage times. Reports can cover any period of hours and dates, and can be sorted by frequency of use, program name, or file name. *TimeLog* can also calculate the total usage for any folder or volume. If you keep projects in separate folders, you can use this information to do time billing. *TimeLog* data can be exported to a spreadsheet for further analysis.

To track the files and programs used, *TimeLog* creates special files with the same names and stores them in a folder in the System Folder. If you use many files, the contents of the tracking folder grow quickly. For three days of use, *TimeLog* created 112 new files on my system. But the files are tiny, so the impact on disk space is minimal.

WindoWatch, an INIT, accounts for time spent in specific windows, rather than tracking program use (although it can do that, too). For example, you may work on several documents in a word processor. You

can see how much time you spent on each file, rather than calculating the total time you used the word processor. Every named window opened in a program—including tool palettes and help windows—appears in the log. You can instruct *WindoWatch* to ignore certain file or window names (Clipboard, for example), and tell it to credit all time to a given application. You also decide how pauses and unsaved files are handled, and you can set file-naming conventions.

The *WindoWatch* log lists the cumulative time spent in each window over whatever period the log has existed. You can sort the log by name or time; combine several entries into one; create a list of frequently used windows; search for entries; and remove all entries under a minute, for example. Logs can also be archived or exported to a text file for additional analysis.

If your main concern is to track program and file use, *WindoWatch* will handle the job nicely. If you have numerous programs in your system, however, using *WindoWatch* for time billing may be a maintenance nightmare. The log records only window names, not file creators or the dates the files were used. If you only use a few documents per client or adopt a consistent file-naming convention (such as using the company name in the file name), you stand a better chance of gathering usable billing information.—STEVEN A. SCHWARTZ

MacWeek & MacUser's 1991 Utility Product of the Year!



Now Utilities

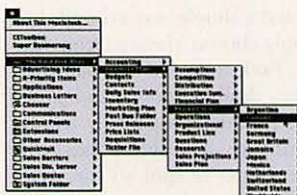
The Ultimate System Enhancement Collection

What did it take to get the editors at *MacWeek* and *MacUser* to agree on the best Macintosh utility product?

Unprecedented performance, compatibility, and value. In this case, a collection of 10 utilities that does for System 7 what products like SUM and Norton do for hard disks — only more so. As *MacUser* put it, "Now Utilities will make your Macintosh faster, easier, and more fun to use." For example:

- **StartUp Manager™** provides complete extension management
- **Super Boomerang™** finds files and folders instantly
- **WYSIWYG Menus™** groups fonts in their own typefaces
- **NowMenus™** makes the Apple Menu hierarchical
- **AlarmsClock™** displays the time & reminders in the menubar
- **NowSave™** automatically saves files to prevent data loss
- **Screen Locker™** keeps confidential information confidential
- **MultiMaster™** launches applications and files
- **Profiler™** analyzes system configurations
- **DeskPicture™** puts color and B&W pictures on the Desktop

In fact, every utility in the collection is the best of its kind. Every utility in the collection is also designed, tested, and guaranteed to work together — and with anything you may have...even System 6. No wonder *MacUser* gave it a perfect five mouse rating and called it, "a must-have for experienced users and novices alike."

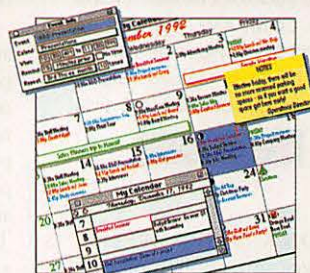


NowMenus saves you a lot of mousing around by creating submenus up to 5 levels deep for anything you put in your Apple Menu items folder — even aliases and other folders. It also pops up the menubar wherever you click your mouse



Super Boomerang lists your most frequently used files and folders in all Open and Save dialog boxes and in the Apple menu. It also lets you find files by name or content...even if they've been compressed (a file name search on a 100MB hard disk can take only 3 seconds — without requiring an index)

MacWeek & MacUser's 1992 Network Product of the Year?



Now Up-to-Date

The only calendar that keeps your appointments and your associates up-to-date — whether you're in the office, at home, or on the road

What will it take to get the editors at *MacWeek* and *MacUser* to agree on the best Macintosh network product?

Perhaps *Now Up-to-Date™*: the only Macintosh application that keeps your appointments and your associates up-to-date — whether you're in the office, at home, or on the road.

Organize Your Appointments *Now Up-to-Date* can schedule a meeting to occur at 9:00 AM on the first Tuesday of every month and have it automatically appear on your associates' calendars. Scheduled events can be private, shared, or restricted (i.e., only available to people with the correct password.)

Remember Your Meetings *Now Up-to-Date* keeps track of all of your meetings and appointments, so you don't have to. It can also provide advance warning of upcoming events to ensure everyone shows up on time.

Mobilize Your Office *Now Up-to-Date's* versatile printing options include support for all major appointment books, so you can take your calendar on the road. If you own a PowerBook you'll appreciate the fact that *Now Up-to-Date* doesn't require you to be connected to a network to see your schedule. For that matter, you don't even need to own a network: *Now Up-to-Date* makes a great single user product, too.

Isn't it time you got up-to-date?



Now Up-to-Date's unique 'Public Calendars' coordinate your schedule with your associates' automatically, so your left hand knows what your right is doing



Now Up-to-Date can repeat events (and their reminders) with whatever frequency you may desire

With all this attention from the press it's not surprising that *Now Utilities* is already one of the best-selling products on the Macintosh. *Now Up-to-Date* looks to be just as popular. Call Now at 1-800-237-3611 to learn more about both of these great products, and how they can help you get more out of your Macintosh.

Now
Software

Interactive Animation Software

Cinematic 1.0

PROS: Automatically records object transformations; can simultaneously animate two or more transformations; supports QuickTime; straightforward frame linking. **CONS:** Underdeveloped paint program and 24-bit video capabilities; background feature doesn't allow gradations; rudimentary text-handling capabilities. **COMPANY:** Vividus (415/494-2111). **REQUIRES:** Mac Plus; 2MB of RAM for color; hard drive; System 6.0.7. Recommended: 4MB for color; color monitor. **LIST PRICE:** \$495.



CINEMATION'S BASIC APPEAL IS that it merges animation, interactivity, and presentation features (see "When Words Aren't Enough" in this issue) into one program, but its real beauty is its ease of use.

Animating an object is simple: you choose the Record command and then transform the object by moving, scaling, rotating, or cropping it. You can also place the original object in one frame and the transformed object in a later frame and use the Fill In Motion feature to automatically generate the movement of an object for all the frames that are in between.

The best way to animate two or more

transformations at the same time—say, both movement and rotation—over the span of a few frames is to change the object into a movie within a movie. For example, you could first record the movement of a bouncing ball. Then you would change the ball into a movie within a movie and record its rotation. Cinematic integrates the two sets of frames, so that the ball rotates and bounces at the same time.

To record an animation, you must first acquire an object to animate. You can import an image stored in paint or PICT format, or use the program's built-in painting tools to draw a new image. The program provides access to 16 million colors, but the paint function is otherwise paltry, lacking antialiasing and all but the most basic tools. The paint program offers a collection of automated gradations, but the only way to apply these to a background is to create a gradation as an object and manually paste it in behind other objects in the desired frames. On the bright side, you can lock objects into place so you don't accidentally move them when you animate other objects.

If you want to draw each frame by hand, a technique known as cel animation, Cinematic helps by offering *ghosts*. These are dimmed versions of objects from a selected range of frames, which you can use as a reference when painting a new image. Unfortunately, only one contiguous range

of ghost frames can exist at a time; you can't see ghosts from just a few key frames, so that you know where you're coming from and where you're going as you draw.

You can pause the playback of a sequence at any frame. The pause may last until the viewer clicks on a specific object, or it may end after a specified amount of time. If the current frame contains an imported QuickTime movie, you can simply pause the frame until the movie finishes playing. At the end of the pause, you can create a link to any other frame in the current file or you can link to an external PICS or QuickTime movie. Create several linked objects within a single frame and you have an interactive presentation: clicking on different buttons takes you to different frames.

Cinematic's image-handling and text-handling capabilities are less than stellar. The program doesn't take sufficient advantage of 24-bit video, so ghosted objects appear dotted rather than tinted; also, rotated and scaled bitmaps frequently appear jagged rather than smoothed via antialiasing. The program's text-handling capabilities are no better. The closest Cinematic comes to leading control, for example, is a simplistic grid function that you can't modify. But taking into account Cinematic's strong interactivity and animation features, I think it will prove a sturdy application in versions to come.—DEKE MCCLELLAND

Form-Letter Templates

Correct Letters 1.1

PROS: Hundreds of letters; text format works with any word processing program; excellent Guide to Letter Writing section. **CONS:** No Find command; categories sometimes misleading.

COMPANY: Wordstar International (415/382-8000). **REQUIRES:** Mac Plus; System 6.0.2; HyperCard 1.2.2 (included). **LIST PRICE:** \$49.



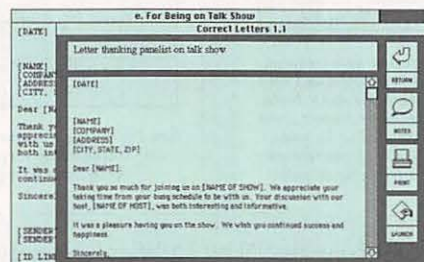
MAYBE THIS HAPPENS TO YOU, too. It usually strikes me when the letter I need to write is a bit unusual—thanking a panelist for appearing on a TV talk show, for example, or answering an inquiry from the Internal Revenue Service. I know what I want to say, but I'm not sure if I'm saying it correctly. So I end up staring a hole in the Mac's screen. Sounds familiar? Then Correct Letters is for you.

Correct Letters consists of a HyperCard-based program called the Viewer, and a Letters Library of more than 250 ready-made business letters. The Letters Library is organized into 11 primary business-as-usual categories, including folders for Sales/Marketing/P.R., Credit & Collections, Customer Service, and Personnel. Each folder

contains several subcategory folders, to make finding the right letter a little easier. Since the letters in the Letters Library are plain text files, you can open them with your favorite word processor.

For simple letters, just type in the missing details (such as name and address), choose Print, and voilà, your letter is complete. The hard part—composing the body of the letter—is done for you. If the letter doesn't quite fit your situation, you can customize it. This may sound as if it defeats the product's purpose, but sometimes a little inspiration is all you need. To this end, Correct Letters is worth its weight in gold.

You can also use the Viewer to browse the Library and view the letters. An instructional note accompanies each letter, describing the letter's content, angle, and purpose.



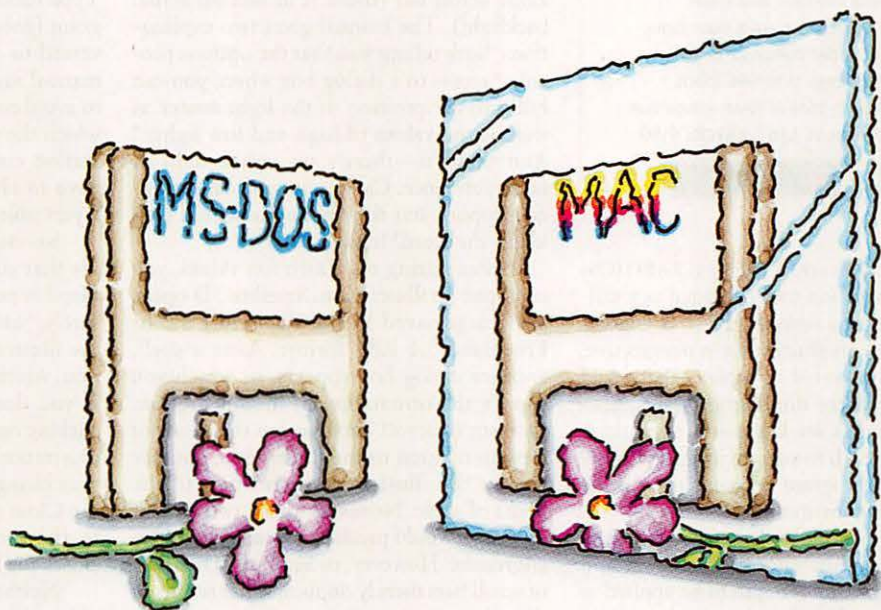
The Writing Business The Launch button automatically opens your favorite word processor and a copy of the letter, ready to be filled in and printed.

When you've found the letter you need, clicking on the Launch button opens your word processor and a copy of the letter, which you can customize, print, and save.

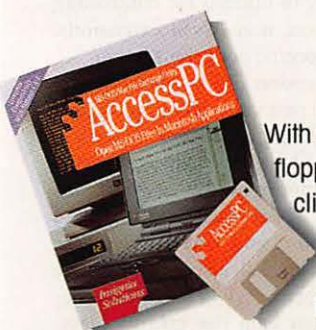
My favorite feature of Correct Letters is the online Guide to Letter Writing. The Guide is organized by small topics to teach you about the planning, structure, appearance, and grammar and usage of business correspondence.

I have just one complaint: HyperCard's Find command is disabled, for no obvious reason. To be fair, many users won't miss it. However, I'm a firm believer in Freedom of Search, so I found a simple way around this limitation. Simply choose Message from the Go menu, type **find**, followed by your keyword enclosed in double quotes, and press return. This technique is especially handy when you're unsure if a letter exists. I wanted to write a letter of apology for, well, a returned check. None of the letters in the Apology Letters folder fit the bill, so I searched for the keyword *apolo* and found an apology for a returned check in the Credit & Collections folder. No two ways about it: the ability to search by keyword should be a standard feature in Correct Letters.

The Find issue aside, Correct Letters is a good product. If a proper business letter means the difference between a closed door and a closed sale, then Correct Letters is a smart business investment.—JOE HUTSKO



Now, MS-DOS Files Can Look Just Like Mac Files.



AccessPC is System 7 savvy as well as completely compatible with Apple's System 6.

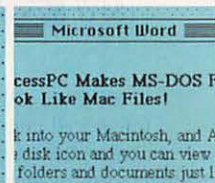
and give the PC folks back their diskette.

AccessPC is so easy to use, it gives new meaning to the word *utility*.

With AccessPC®, you just pop any DOS floppy in your drive, and in a couple of clicks, what you see on your desktop are Mac files.

And they not only look just like Mac files, they act just like Mac files in Mac applications.

You can edit, copy, save, print, play with the numbers, print again,



Put MS-DOS disks in your SuperDrive, double-click on the DOS file, and open it in your Macintosh application.

Plus, it includes powerful Multi-Driver™ and Media Formatter™ utilities, *free*. You get instant compatibility even with DOS removable cartridges and optical drives. And you can get access up to ten times faster than with other utilities.

Pick it up today. You'll be amazed at how such an inexpensive little utility can make you look so good.

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AccessPC and SoftPC are registered trademarks and Multi-Driver and Media Formatter are trademarks of Insignia Solutions Inc. All other product names are trademarks or registered trademarks of their respective owners.

Circle 235 on reader service card

3-D Enhancement Utility

Satellite 3D 1.5.3

PROS: Applies perspective to isolated objects.**CONS:** Confusing interface; inadequate documentation; operates on entire illustrations only; improperly handles composite paths.**COMPANY:** Calliscope (415/964-8550).**REQUIRES:** Mac II; 2MB of RAM; Adobe Illustrator or Aldus FreeHand. **LIST PRICE:** \$199.

SATELLITE 3D, A NEW GRAPHICS-transformation tool packaged as a utility, provides two services. First, it enables you to display an illustration in perspective, as if it were mounted on a plane that could be rotated in three-dimensional space. Second, it provides an Extrusion command, which adds depth to surface images. Unfortunately, the program is confusing and the interface is inconsistent.

Before opening an illustration in Satellite 3D, you must choose Extrusion and specify the amount of depth to be applied to the illustration. You can also position a light source and enter minimum and maximum brightness values. The depth controls are straightforward enough, but the lighting controls are unnecessarily complex. One

scroll bar lets you position the light source anywhere from the Zenith to the Nadir of an illustration. To control the horizontal and forward/backward position of the same single light source, you use the Backlight Zone scroll bar (there is in fact no actual backlight). The manual gives two explanations, both telling you that the options provide "access to a dialog box where you can indicate the position of the light source as well as the values of high and low lights." And that's it—there's no online help or other reference. Calliscope provides technical support, but the phone number is buried in the ReadMe file.

After setting the Extrusion values, you can open an illustration. Satellite 3D opens any image saved in the Illustrator 3.2 or FreeHand 3.1 EPS format. After a spell, another dialog box appears, in which you specify the orientation of the illustration. One set of scroll bars rotates the point of view in relation to the illustration, another rotates the illustration in relation to the point of view. Normally these two similar functions would produce perceptibly different results. However, in Satellite 3D one set of scroll bars merely duplicates the results of the other.

After you apply the orientation settings, Satellite 3D renders your illustration on screen. From there, you can change most of these settings (to change the Extrusion set-

ting you must reopen the illustration). All settings are applied to the illustration; Satellite 3D provides no way to select an individual object and treat it distinctly.

Satellite 3D's object handling rates fair. Type handling is another matter. The program ignores type unless it has been converted to outline paths. Even then, as the manual says, you should redraw the letters to avoid composite paths and masks, both of which the utility mismanages. If your illustration contains overlapping objects, you have to choose Sorting, which accurately layers objects (at the expense of speed).

Saving the 3-D illustration as an EPS file that you can edit in Illustrator or FreeHand is perilous. If you close a file prematurely, Satellite 3D prompts you to save not the illustration itself but the Spatial Situation, which amounts to a preference setting. If you don't save the current file before clicking on the Close button, you've lost the illustration for good. If you click on OK but then change your mind and click on Cancel, the Close command cancels and you return to the unsaved file. Satellite 3D merely closes the file without saving it.

Neither Illustrator nor FreeHand provide sufficient transformation capabilities. Satellite 3D offers a function that both programs lack, but I cannot in good conscience recommend this program.

—DEKE MCCLELLAND

Software-Development System

Think C 5.0

PROS: Easy to use; tightly integrated software-development environment; fast compilation. **CONS:** Insufficient documentation for novice programmers.**COMPANY:** Symantec Corporation (800/441-7234). **REQUIRES:** Mac Plus; System 6.0.Recommended: 2MB of RAM. **LIST PRICE:** \$249.

WITH ITS SPEED AND WELL-integrated compiler, editor, linker, and symbolic debugger, Think C 5.0 is an excellent software-development tool, especially for beginners. The compiler, designed specifically for the Mac, is 100 percent ANSI-compatible. You can create applications, DAs, device drivers, and stand-alone CODE resources with it. Think C includes extensive libraries and source files for accessing all the Macintosh Toolbox routines, including System 7 features. The compiler also has a number of non-ANSI extensions, such as inline assembly language, that make it even easier to write programs.

The heart of a Think C program is the project: the set of source-code modules and libraries that you collect to make up a complete program. The compiler tracks all the

program fragments and their dependencies, simplifying software development. If you make a change to one module and then try to run the updated program, the compiler first asks if you want to update the project. If so, it recompiles all the modules that refer to the source code you just changed.

Think C includes both an editor and a linker as part of the development environment—you don't have to switch back and forth between separate programs. After you make changes to your program, all you need to do is choose the Run command. Think C automatically links all the modules and launches your program in a separate partition (if you're using MultiFinder or System 7). If you're running the Finder with a System prior to 7.0, Think C quits itself and launches your program. When your program finishes, Think C starts up again.

In addition to the compiler, editor, and linker, Think C's symbolic debugger lets you follow the execution of your program at the source-code level. You can trace each program statement as it executes and examine the program's values of variables and data structures. The debugger, a separate program, is activated simply by turning it on in the development environment. When you start running your program, the debugger windows appear. The source window shows your source code and the current execution point. The data window shows vari-

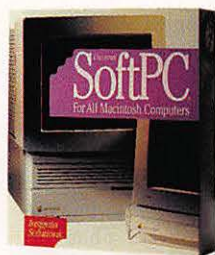
ables and structures and their values.

Overall, Think C has a lot of features that make it easy to develop programs. For instance, when you're editing source code, you can hold down the option key and click on the editor window's title bar, and a list of all the referenced files appears. If you select one of those file names, another editor window opens for that source file. The program also has a variety of options for controlling code optimization, non-ANSI extensions, and processor-specific code generation.

Although version 5.0 is not a radical improvement on past versions, it is a significant upgrade. Changes include System 7 compatibility (32-bit addressing, virtual memory, and support for the *Inside Macintosh, Volume VI*, specifications), increased code optimization, and improved editor shortcuts. Version 5.0 also includes the Think Class Library 1.1, a set of source-code modules that help you create object-oriented programs. TCL 1.1 includes support for many System 7 features, including Apple events and file aliases.

While Think C 5.0 is easy to use, beginners won't find the documentation helpful. It doesn't include a C language reference manual, and the user's manual does not discuss Macintosh programming or the Toolbox in any depth. In spite of the lack of hand-holding, Think C is an outstanding development environment.—STEVE MANN

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Fiction-Writing Tool

Plots Unlimited 1.4

PROS: Can be used to quickly outline a story plot from scratch; easy to learn and use. **CONS:** Not helpful for stories in progress; weak interface.

COMPANY: Ashleywilde (310/456-1277).

REQUIRES: Mac Plus; hard drive. Recommended: 2MB of RAM. **LIST PRICE:** \$399.



SITTING DOWN TO REVIEW PLOTS Unlimited made me stop to think about the process of writing fiction, but since I'm not Nadine Gordimer, Milan Kundera, or anyone else you'd turn to to learn the craft, I'll just tell you what Plots Unlimited can help you do—or more precisely, what it helped me do.

The program's database contains 5600 plot twists, all linked to one another. Each time you select a new twist for your story, the program helps you choose the next one by offering a list of plausible possibilities. The program presents a series of screens to be navigated via buttons and menus. After a day learning it, I tried three exercises.

First I plotted a story from scratch—with no ideas whatsoever in mind. This went smoothly until the program suggested that

Peter, who loved Allison, might admit to committing a murder, and that Allison might then suffer a breakdown. The trouble was that no one had been murdered, the plot was nearing its end, and besides, Peter was by then way too nice to have killed anyone. I clicked through several more options before exporting the outline to Word and adding my own final plot twist. Conclusion: the database's logic is helpful but not infallible. So whose is it? It had still helped me construct a logical plot in less than an hour.

My second exercise was to plot a story I had only vague ideas about: two characters, the first and last pages, a mood, and two lines of dialogue. I chose one of seven plotting methods and restricted the possibilities by specifying that this was to be a mystery with a female protagonist and a female stranger. The program responded, "There are no conflict situations in the file that match the conditions you have selected." I then tried a method with fewer specifics; Plots Unlimited offered only one starting point, which was light-years from what I had in mind. I moved on to a wide-open method but in an hour of browsing couldn't find a good starting point among 1055 possibilities.

My third exercise was to solve the midplot crisis of my own half-finished suspense novel. Unfortunately, Plots Unlimited didn't help in the course of two hours and four methods. I followed directions by

breaking my story down to essentials, but the program still couldn't move it forward; the plot twists it proposed just didn't fit.

The interface isn't difficult, but it needs quite a bit of improvement. First and foremost, it requires too much mousing. The cursor keys don't work, my universal QuickKeys macros for clicking buttons don't work, and there are only seven keyboard commands. I already have repetitive strain injury from too much mousing, so three days of Plots Unlimited left me in pain.

Another problem is that buttons and menu items are often boldfaced when they should be grayed out to indicate they're disabled, so I'm still wasting time clicking on inactive buttons. Also, there were times when I wanted to change my choice of the plotting method and had to start over to do so. The horizontal scroll bars don't work in the MasterPlot section, although the company is working on fixing that bug.

My experience suggests that the program is best for brainstorming from scratch. Still, writing and brainstorming styles are so individual that I can't predict similar results for all users. My guess is that Plots Unlimited is most helpful with category romances or TV and movie scripts, not novels. You won't turn out a million-dollar plot just by clicking on buttons. You might, however, produce a usable rough working outline in an hour's time.—ANN GARRISON

Personal PostScript Printer

LZR 960

PROS: Fast; small footprint; has PostScript Level 2 interpreter. **CONS:** Low-memory problems when printing complex documents with 2MB configuration. **COMPANY:** Dataproducts Corporation (818/887-8000). **LIST PRICE:** \$2695.



THE DATAPRODUCTS LZR 960 IS A 300-dots-per-inch personal laser printer that's hard to beat. It's compact: shaped like a cube, it's roughly 13 inches on a side. It's also fast: thanks to the printer's high-speed Weitek RISC processor and Sharp 9-pages-per-minute print engine, the LZR 960 beat Apple's new Personal LaserWriter NTR in all of Macworld Lab's speed tests.

The LZR 960 has an Adobe PostScript Level 2 interpreter (and emulates the HP LaserJet Series IIP). When Apple produces drivers that utilize Level 2's memory management and form caching, the printer's performance should improve even further.

Printed output is excellent, with rich blacks and crisp, clean edges. When printing large areas of solid black, the LZR 960 has good toner coverage, with no streaks or banding. Halftones look sharp as well.

The LZR 960 had difficulties printing legal-size documents in landscape orientation, generating low-memory error messages. Memory alerts also occurred while printing various complex Illustrator documents that included several downloadable PostScript Type 1 fonts, resulting in either slow printing or a message that the document had too many fonts. The tested printer had 2MB of RAM; at press time, Dataproducts announced that the LZR 960 is now shipping with 3MB of RAM. Dataproducts claims that this RAM increase should solve most memory problems; RAM expansion up to 10MB is also available.

A 250-sheet letter tray, a 250-sheet legal tray (\$59), or a 40-envelope feeder (\$399) slides into the bottom of the printer. The tray fronts are flush with the front of the printer, but the legal-size tray protrudes at the back. The printer also has a manual-feed slot. Paper exits the printer either face-down on top or face-up from a tray in the back. The face-up tray is useful for heavy paper stock and sheets of labels.

PERSONAL PRINTER PERFORMANCE

Test	LZR 960	Apple Personal LaserWriter NT	Apple Personal LaserWriter NTR
Courier	163	317	325
FreeHand	465	2053	534
MacDraw Pro	141	395	182
Multiple Fonts	160	599	277
Newsletter	108	190	175

Macworld Lab compared the LZR 960's performance to that of Apple's personal printers using 5 tests: Courier (a 20-page Word 5.0 document in courier, including bold and italic); FreeHand (an Aldus FreeHand illustration); MacDraw Pro (a newspaper graphic containing over 2200 objects, plus text); Fonts (a 7-page Word 5.0 document in several fonts and styles); and Newsletter (a 4-page Aldus PageMaker document containing several fonts, 3 gray-scale scanned images, and a MacPaint image). Times are in seconds.

The LZR 960 has AppleTalk, RS-232 serial, and parallel interfaces; and you can plug in a SCSI hard drive to store PostScript printer fonts. (The printer comes with 35 built-in fonts.) The LZR 960 automatically switches to the active interface.

Dataproducts sells the LZR 960 for \$2695 with a two-year warranty, but the mail-order company Hardware That Fits also sells the printer as the RealTech Laser for \$1995. The Apple Personal LaserWriter NTR lists for \$2199. Given that the NTR is more limited, with a 70-page paper tray (a 250-sheet tray costs \$199 extra) and a 4-ppm print engine, I'd recommend the LZR 960 or the RealTech Laser.—TOM NEGRINO

Shredder 1.0.1

PROS: Easy to use; supports Apple events. **CONS:** Tech support difficult to reach. **COMPANY:** DLM Software (619/283-2343). **REQUIRES:** Mac Plus; System 7. **LIST PRICE:** \$69.



TrashMaster with Incinerator 1.0

PROS: Inexpensive; customizable trash emptying. **CONS:** Some extraneous functions; some features available only with System 7. **COMPANY:** Utilitron (214/727-2329). **REQUIRES:** Mac Plus; System 6. **LIST PRICE:** \$69.95.



HUMANKIND HAS LONG STRUGGLED with the burden of trash—where to put it, who's responsible for it, and how to get rid of it. These conundrums now apply to digital refuse. Two new utilities strive to facilitate the permanent removal of desktop garbage. One's hot, one's not.

Shredder (not to be confused with Microcom's Citadel with Shredder) is an application that writes over deleted data so

that file-restoration programs cannot recover it. Normally when you empty files from the Trash, the data still remains on the hard drive—you just can't see it. Shredder overwrites that area, either with 0's, random 0's and 1's, or—in accordance with Department of Defense specifications—three times over with random 0's and 1's. When you want to permanently delete a file, you just drag it to the Shredder icon and in seconds it's history. You can tell Shredder to warn you before it shreds—a good idea, since once a file's gone it's gone for good. The utility also includes Scrubber. Scrubber overwrites blank areas on the hard drive that may still hold confidential data that was trashed the normal way. Scrubber can also delete the miniature backup that some applications tack onto the end of saved files.

TrashMaster with Incinerator, on the other hand, is a cdev that enhances the Empty Trash command. TrashMaster lets you view all the files in the Trash folder and, if you choose, automatically empty just those files that match a set of filters. Filters exist for a wide range of file formats as well as for file size, age, and extension. You can also set filters to empty the Trash once hourly or once daily. Like Shredder, TrashMaster can write over deleted file data, using the Incinerator filter. The Incinerator filter is optional; if you don't use it, data is treated like normal trash.

I must admit I don't understand the filtered trash concept. To me, this is like throwing your garbage into your trash can at home and then instructing the trash collector to take only the banana peels. You have to deal with this trash eventually—why not throw it all away in the first place?

Both Shredder and TrashMaster work without any problems. As the programs promised, I was unable to recover any files that had been shredded or incinerated. I prefer Shredder, simply because it lets you easily and quickly decide how to deal with unwanted files. If I want a file removed permanently, it goes to the Shredder icon. If I need a little cleanup, I drag a file, hard drive, or floppy disk to the Scrubber icon. Using TrashMaster's permanent-file-deletion function is not as easy; you must wade through a series of filters to get to Incinerator's file-overwriting capabilities. Also, there's no easy way to discriminate between sensitive material and files you might need to recover later. TrashMaster gives you about three seconds to abort the operation; with Shredder you must click on Yes in a dialog box to confirm permanent deletion.

If all you need is quick and easy solid data security, get Shredder. If the Mac's normal Empty Trash command isn't enough for you, consider TrashMaster with Incinerator. Because frankly, I'm tired of talkin' trash.—MATTHEW R. CLARK

Cross Country

PROS: Inexpensive; good instrument-flight tutorial; audio air-traffic-control dialogs. **CONS:** Black-and-white screens; weak flight dynamics; incomplete operating manual. **COMPANY:** T-34 Microsystems (904/396-2785). **REQUIRES:** Mac Classic. Recommended: Hard drive. **LIST PRICE:** \$180.



CROSS COUNTRY LETS YOU STUDY and drill complex navigation and procedure recipes without unnecessary frills. The program displays a typical Cessna 172 trainer, with all instruments required for IFR (instrument-flight rules) flight; there are no out-the-window 3-D views, and the flight dynamics are primitive. The absence of an outside view allows for larger instruments than in other flight simulators, but the panel's fixed-size window doesn't let you take advantage of additional screen space if you have it. Also, graphics are black-and-white only, so you must run Cross Country in 1-bit mode on color Macs.

But Cross Country performs its job well. In addition to the panel display, you can punch up a track view that shows your

flight path on an IFR map. You also can speed up the rate of simulation by two to five times, to hurry through uninteresting "straight legs" to get to "the good part"—the instrument approach at the end of the flight. During approach a profile view lets you compare your vertical descent path with the ideal glide path expected by the FAA. You can save or print any of the displays.

Cross Country's 100-page operating manual is clear but incomplete; it ignores some cockpit items (for example, the flap handle and DME gauge) and lacks an index. The package includes navigation databases and printed charts for several small regions of the United States, and you can construct your own databases using data from FAA navigation charts.

You control Cross Country with either a mouse or a joystick. To manipulate cockpit controls, you must first press the spacebar to switch to cursor mode, and then point and click with the mouse to twirl knobs, slide levers, or push buttons directly on the instrument panel. There are no keyboard controls. After making panel adjustments, you press the spacebar again or click inside the Attitude Indicator to return to flight mode. This procedure is somewhat inconvenient. Also, because Cross Country doesn't have buttons for changing radio frequencies (a recurrent chore in IFR flight), you must position the cursor in a precise

way to change individual frequency digits—an error-prone and tedious process.

You control the wind speed and direction, cloud ceiling, and turbulence, so you can practice pilot techniques of compensating for these factors. You also can selectively disable various instruments for partial-panel and emergency-procedure drills.

Cross Country's crude flight dynamics probably constitute its worst flaw, although it's not a critical one. Things move with a mechanical surety that belies real flight: turns are perfectly round, deck angle never varies once you set it, and instrument needles move at steady, fixed rates. It doesn't have an aerodynamic feel.

Perhaps the single best feature is Cross Country's built-in instrument-flying tutorial. Ten lessons cover everything from basic maneuvers and instrument scans to procedure turns and precision approaches. The text is concise, yet contains valuable procedural strategies based on military IFR techniques. Lesson files on disk let you practice the material and evaluate your performance, and sound files simulate air-traffic-control communications.

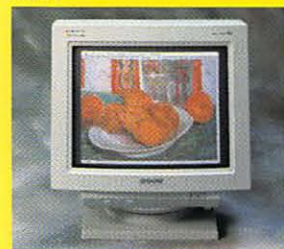
All in all, Cross Country accomplishes its mission of IFR procedural training. If you want to add an instrument rating to your license, this program lets you get a taste of flying on the gauges while acquiring skills useful to any pilot.—MEL BECKMAN

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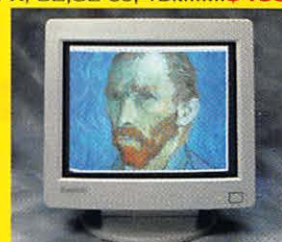
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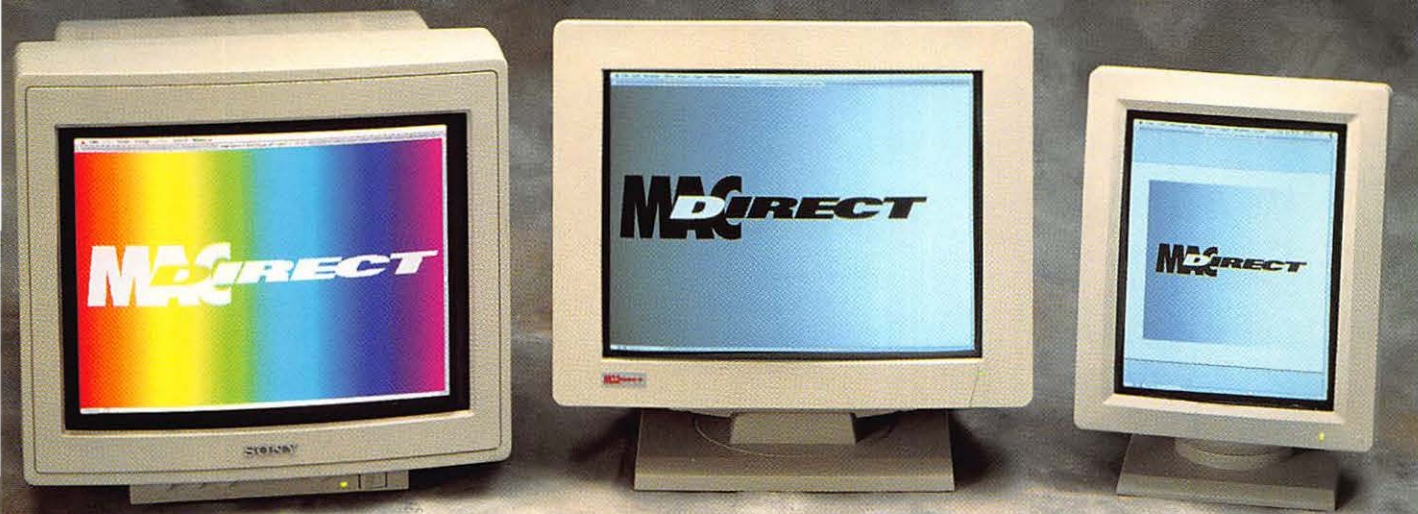
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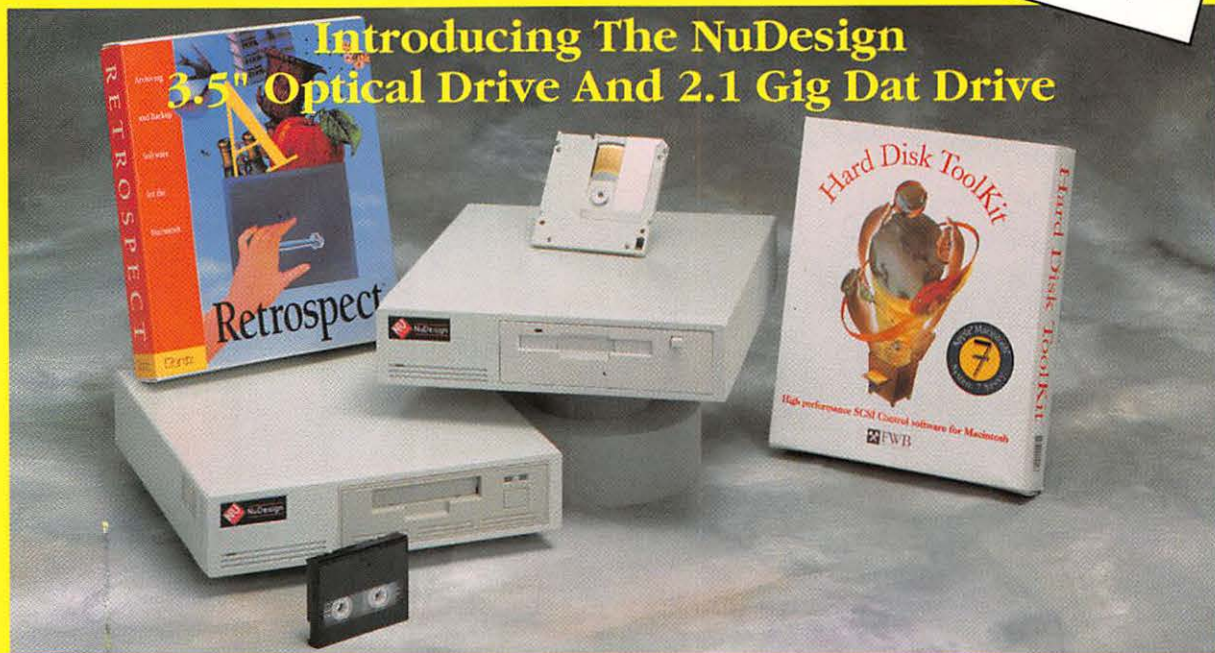
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135 MB 3.5" 3yr warr, 50,000 MTBF	\$378	\$448
185 MB 3.5" 3yr warr, 50,000 MTBF	\$498	\$568
<ul style="list-style-type: none"> • Incredibly reliable less than .0006% returned on the 45mb! • 3 year warranty! 50,000 hours MTBF (Mean Time Between Failure) 		
330 MB 3.5" 9ms Access	\$1128	\$1198
425 MB 3.5" 9ms Access	\$1098	\$1198
520 MB 3.5" 9ms Access and Fast SCSI (The Fastest 3.5" Available!)	\$1249	\$1318
<ul style="list-style-type: none"> • Incredibly fast the PB-4 drives are the fastest 3.5" drives we have tested! • 5 year warranty! 200,000 hours MTBF 		
680 MB 5.25" 16ms	\$1288	\$1388
1.2 Gig 5.25" 11.5ms (MacWorlds Fastest Gig!)	\$1948	\$2048
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Interface Utilities

Zephyr Palettes for
PageMaker 1.0.2Zephyr Palettes for
FreeHand 1.0.2

PROS: Provide convenient access to frequently used PageMaker and FreeHand menu functions; allow on-the-fly formatting; compatible with Adobe Type Reunion; friendly technical support. **CONS:** Grouping instructions are not saved; most pop-up menus don't scroll; some problems grouping font families; user cannot type selection directly into pop-ups. **COMPANY:** Zephyr Design (206/324-0292). **REQUIRES:** Mac Plus; 2MB of RAM; hard drive; System 6.0.3; Aldus PageMaker 4.0 or Aldus FreeHand 3.0. **LIST PRICE:** \$79.95 each.



ZEPHYR PALETTES (ZP) ARE CLEVERLY conceived utilities that make Aldus PageMaker and Aldus FreeHand easier to use. Each utility creates several small palettes that float above the PageMaker or FreeHand application window. Each palette duplicates—often enhances—a function found in the main program's pull-down



One-Stop Control Zephyr Palettes provides easy access to frequently used controls. Here, the PageMaker palettes have been grouped into a single bar you can float at the bottom of your screen.

menus. For PageMaker, there are font, size, leading, tracking, alignment, style, and zoom palettes. For FreeHand, palettes are for font, size, style, effects, leading, alignment, pen, and zoom. You choose which palettes to display on screen.

ZP consists of a cdev (or control panel for System 7 users), shared by both versions, and a Zephyr Palettes folder that goes inside the System Folder. The PageMaker version also supplies an addition for PageMaker 4.2 that can be used in place of the cdev.

You can move palettes to any location on screen and set them to reappear there the next time you open the program. You can also use a ZP Group command to fix a palette arrangement; then you can move the whole unit on screen as needed. Unfortunately, ZP does not remember grouped palettes, so when you open the utility again, you must group them again. Zephyr Design expects to fix this in an upgrade.

The size, leading, and tracking palettes contain the same items as do the PageMaker and FreeHand menus, but Zephyr Palettes adds the ability to constantly preview selec-

tions (at some sacrifice in speed). Moving through the size menu, for instance, changes the type size on screen. Unfortunately, when a palette (except the font palette) is close to the bottom of the screen, the lower part of the pop-up menu does not scroll into view and is lost. Nor can you type a number directly into the pop-up menu's window.

The font palette contains two pop-up menus. One displays typefaces arranged by family, with individual members shown in a submenu. This can coexist with Adobe Type Reunion, which performs a similar function; you can still use Type Reunion to control FreeHand or PageMaker's font menu. Zephyr Palettes is less successful than Type Reunion at correctly arranging font families. ZP's second pop-up menu lets you create and select custom groups of fonts, minimizing the size of the floating font menu.

The utilities are modestly priced but quite useful, particularly on large monitors. A number of details remain to be smoothed, but none are fatal. Purchasing Zephyr Palettes means buying a work in progress—but it's worth the investment.—BILL JUSTIN

Network Bulletin Board

PacerForum

PROS: Users can set interest level for bulletin boards; can include images, sounds, or files with messages; can search topics and text; can set inactive topics to be deleted after specified period of time. **CONS:** Displays look best on color monitors; no integration with other network software; no provision for archiving. **COMPANY:** Pacer Software (619/454-0565). **REQUIRES:** Mac Plus for server; AppleTalk network. **LIST PRICE:** \$549 (five clients and one server).



ALTHOUGH E-MAIL HAS BEEN A popular way to exchange messages and files with other users, it's difficult to maintain a series of related messages on E-mail the way telecom users do on bulletin board systems (BBSs). Options similar to BBSs are now available for networked users, and PacerForum stands out as a network BBS with a well-designed graphical look.

PacerForum presents the typical functionality of a BBS. With PacerForum, you create a forum (the equivalent of a BBS) on each server; you can have multiple forum servers. Each forum consists of a set of bulletin boards, and each board contains a se-

ries of topics. Each topic in turn is a thread of related messages. Every board has its own color picture (Pacer calls it an icon) for easy identification, and each topic also has its own color picture. Messages can include a PICT file (copied from the Clipboard), a sound file recorded within PacerForum, or any file that you want to make available.

To set up PacerForum, you need to install the Forum INIT and a Forum Server folder on a networked Mac—it can be an AppleShare server or any Mac that's not used frequently. (PacerForum can run in the background on any Mac with 1MB or more of RAM.) You use the ForumAdmin application (running on any networked Mac, not necessarily the server) to create user accounts with user names and passwords. Users are assigned privileges: create boards, create topics, create responses, read only, and create icons. You can also create groups of users, similar to groups in AppleShare.

Once you log on to a forum, a window containing the color icons for all current boards appears. Double-click on one of the boards, and a window with color icons for all the topics within that board appears. Double-click on a topic icon, and you can read the messages in that topic. When a message has a file, PICT, or sound attached, a small identifying icon appears below the message. If you double-click on that icon, you either transfer the file to your Mac (if

it's an attached file), view the PICT file, or hear the recorded sound.

PacerForum lets you set your interest level for each board. If you select the high interest level, you'll be notified of any changes to that board as they happen. Moderate interest means you don't want to be notified of the changes, but new information will be displayed in a bold typeface when you view the board or a topic. The low interest level means the selected board or topic will be displayed at the bottom of your list of boards or topics. (It's not quite "out of sight, out of mind," but it's close.)

PacerForum also includes a Find command for navigating a forum. If you are at the board level, you can only search board and topic names. If you open a topic, you can use the Find command to find text within the messages.

I like the looks and performance of PacerForum. The color icons make it easy to distinguish topics, though the icons don't look nearly as good on a monochrome Mac as in color. PacerForum also makes forum administration easy by allowing you to set a time-out period for deleting topics when there's been no activity. There should be an administrator option to archive an inactive topic rather than just delete it. But if you need a way for groups to exchange and record ideas over a network, I recommend PacerForum.—DAVE KOSIUR

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Window-Management Utility

Kiwi Power Windows 1.5

PROS: Handy window menu; variety of preset and user-defined window arrangements; powerful work-set function; cleverly designed window-rotation command. **CONS:** Work-set management unnecessarily difficult; preset window arrangement names often too cryptic. **COMPANY:** Kiwi Software (805/685-4031). **REQUIRES:** Mac Plus; System 7. **LIST PRICE:** \$79.95.



KIWI POWER WINDOWS (KPW) IS A system extension that adds a new menu to the menu bar of the System 7 Finder and the menu bar of all open applications. KPW's hierarchical menu lists all open windows in both the Finder and your applications. Thus a single submenu selection can move you to any window in any application—even if it's buried under piles of other windows or hidden from view with one of the application menu's Hide commands—from anywhere else on the desktop.

Two Layout commands neatly arrange your windows—either those of the current application (local) or those of all applications (global)—in one of dozens of preset schemes. Preset layouts can organize almost

any number of windows on one or more screens; they range from simple stacks of full-size windows to a wide variety of more-complex tiling arrays. You choose whether to include Finder windows in global layouts and whether to keep the right edge of the screen clear (so you can see your disk icons). Reorganizing windows takes a little time, but it's much faster and more precise than doing so manually.

You can also create custom layouts by taking a snapshot of a window arrangement. Like preset layouts, custom layouts can be local or global, but unlike preset layouts they can be used only with a specific number of windows. The KPW Manager utility lets you create custom layouts on a mock desktop, edit custom layouts, rename layouts, and add or remove layouts from the menu.

With KPW, you can also create *work sets*, predefined collections of specific applications and documents. Although superficially similar to HandOff II's briefcases, work sets differ in that they re-create the precise position and size of all windows (including Finder windows, and their view mode, if you so choose). Work sets are created by taking a snapshot of open programs and documents (not via a dialog box, as in HandOff II); and they cannot be edited (briefcases can). Work sets can be opened from the KPW menu, from a folder added to the Apple menu, or by double-clicking on

a work-set file. (A separate system extension, BeHierarchic2, converts folders into submenus in the Apple menu.) Unfortunately, work-set management (deleting work-set folders, for example), is much harder than it needs to be. In addition, I often ran into many extension conflicts.

A Rotate command allows you to cycle through all the windows in an application. Used with a preset layout, Rotate rearranges all the windows so that the second window assumes the size and position of the first, and so on. A Send to Back command does exactly that for the active window and is handy for moving a big window out of the way. Minimize and Maximize commands shrink and expand windows to previously established sizes and locations. And if you choose, KPW can remember all your open windows at shut down and reopen them for you at the next start-up.

I was plenty skeptical when I first received KPW, but I now believe most Mac owners would find it handy. Work sets will appeal to anyone who repeatedly opens the same sets of documents. If you keep a lot of windows open at once (especially on large or multiple screens), you'll appreciate the instant window selection and preset and custom layouts. And if you work with only one or two documents open at a time, Kiwi Power Windows may well revolutionize the way you work.—ROBERT C. ECKHARDT

Finder Utility

Workspace 1.0

PROS: Organizes applications and documents; eye-catching interface; automatic time tracking. **CONS:** Recognizes only 23 applications; no Find function; difficult to distinguish documents in miniature form. **COMPANY:** Ark Interface. **REQUIRES:** Mac Plus; 2MB of RAM; hard drive; System 6.0.5. **LIST PRICE:** \$149.



EVEN WITH SYSTEM 7'S NIFTY FILE-handling enhancements, managing multiple applications and documents using the Macintosh Finder can be a chore. Workspace tries to improve on the Finder with a novel visual approach that makes an intriguing first step but left me wishing for more.

An application and extension (INIT), Workspace has one version for monochrome systems and one for color systems. The application functions as an "office manager." Workspace opens to a window showing a cheerful work area containing a table flanked by shelves and drawers. You can also choose one of the two more-avant-garde room layouts.

On the left of the screen are nine application binders, arranged by category (draw-

ing, page layout, and so on). The first time you run Workspace, it scans your hard drive and tosses programs into the appropriate binders using pointers—similar to System 7 aliases—to link files. Double-clicking on a binder brings up a list of its applications for you to open. But the binders are identical except for color, and you must click on them or press the option key to view their names.

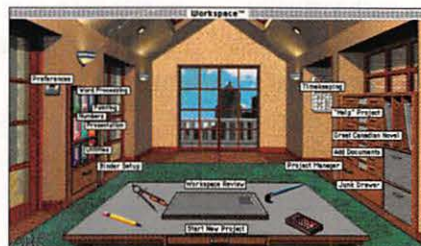
Also, the program recognizes only 23 programs. You have to place other applications into binders manually. And since Workspace lacks a Find function, you must navigate through layers of folders in search of programs. Clicking on tool icons left on the tabletop also launches applications, but that's no improvement on the Finder.

Workspace's most useful feature is its ability to handle groups of related documents, or projects, which it keeps in port-

folios. When you begin a new project, Workspace creates a folder on your hard drive to store its files; you can either transfer existing documents into the folder or simply link them to the project. New documents are automatically saved to the open project (you can move them if you want). Double-clicking on a portfolio displays a scrolling list of the project's documents. Shift-clicking isn't supported, so you must open multiple documents one by one; or you browse and open files from the Project Overview window, which presents documents in miniature form, but many types of documents (spreadsheets and word processing files) are often indistinguishable in this view.

Workspace automatically logs time spent on projects, suspending timekeeping after a user-specified period of inactivity. You can also turn time recording on and off manually. You can view and print daily, weekly, or monthly time reports.

If you just hate dealing with the Finder and need automatic timekeeping, I'd say give Workspace a try. For my money, though, it doesn't offer enough value compared with more conventional software like Now Software's Now Utilities or Microseeds Publishing's HAM. With a few additional file-management functions (version 1.1 may be shipping by the time you read this), Workspace could become a worthy competitor.—FRANKLIN N. TESSLER



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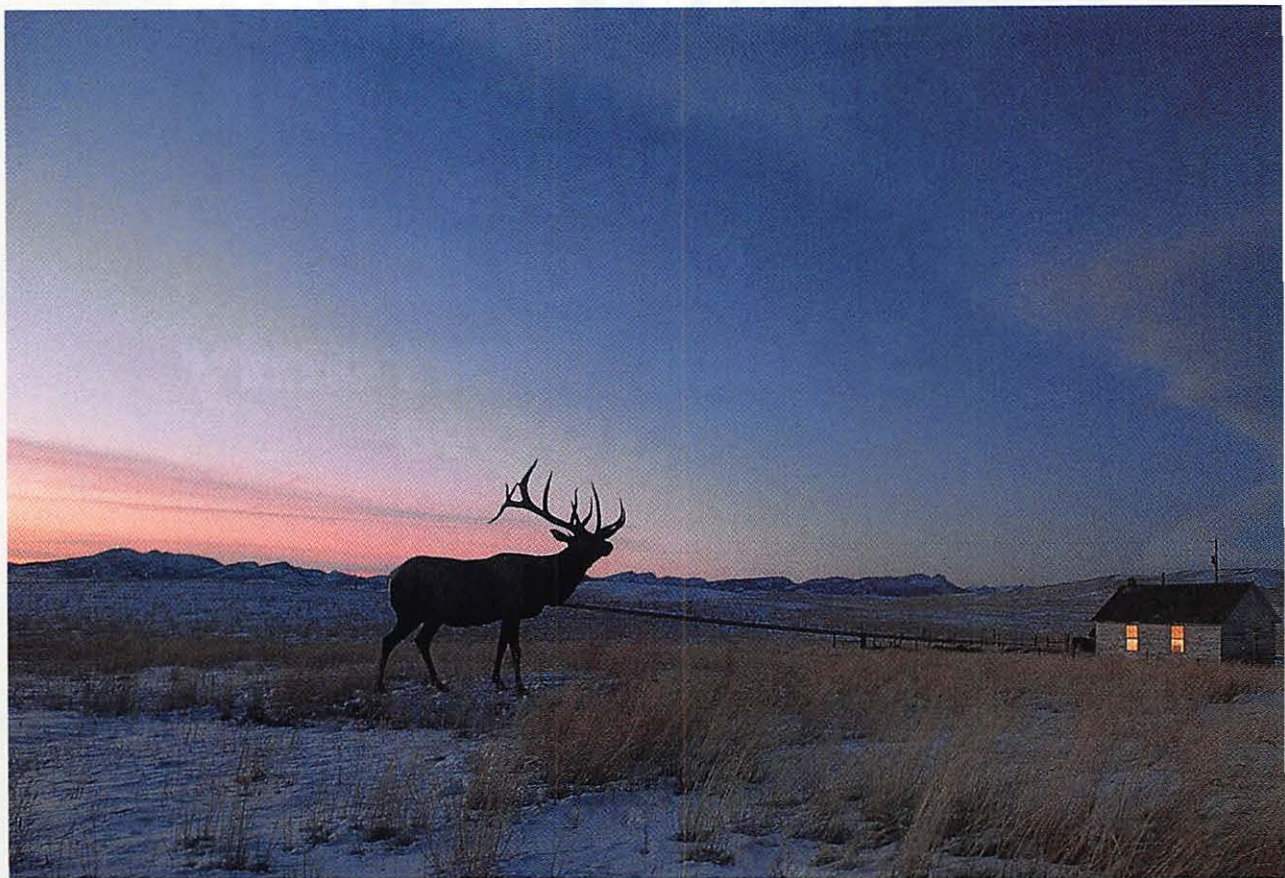
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Losing the Finder

BY DAVID POGUE

WHOA—I THOUGHT THE Finder in System 7 was supposed to *eliminate* the need for add-ons such as file finders, program launchers, and file managers. How come we're suddenly inundated with utilities that try to out-Find the Finder? Anyway, nobody's objecting; it's fascinating to see what each company thinks the Finder is missing.

HAM 1.0

HAM STANDS FOR "HIERARCHICAL APPLE menu." Sure, you can stick any folder you want into your System 7 Apple menu, but wouldn't it be nice if a submenu popped out to show you what's in that folder? That's what HAM does (Microseeds Publishing, \$99). Heck, you can stick your whole *hard drive* into the Apple menu, and HAM gives you menu-selectable access to anything on it, sprouting up to five submenus to show you what's inside nested folders. (Since other programs offer different combos of the same features, I'm going to call them by number; see "Features Key." HAM has features 2, 4, 5, and 6.)

The brilliant part of HAM is the Recent Items folder that it puts into the Apple menu; from the Recent Items submenu, you can choose any program, folder, or document you've opened recently (feature 5). You save hours of foraging. And you can launch a whole glob of related applications and documents at once (features 2 and 6).

I ran into some little bugs, and \$99 is steep, but in general HAM is a joy—a sweet and simple System 7 accessory.

MenuChoice 1.1

IT'S ONLY FAIR TO MENTION THAT FEATURES 4 and 5 are available for only \$15 in the form of MenuChoice, a shareware control panel by Kerry Clendinning.

Hand-Off II 2.2.5

HAND-OFF'S MOST FAMOUS FEATURE IS *application substitution*, whereby when you double-click on a MacWrite document, for example, your preferred word processor (say, Microsoft Word) opens that doc-

ument—no "application not found" message. I never really got jazzed up about application substitution (feature 3); it's good for MacWrite, text, and PICT files, but that's about all I can think of.

Fortunately, substitution is almost beside the point in the new Hand-Off (Connectix Corporation, \$99), which also gives you features 2, 4, 6, 7, and 8. What really makes Hand-Off sail is the tiny menu it crams at the edge of the screen, listing your choice of files and programs for quick launching. Of course, that's what System 7's Apple menu is for, so the Launch menu is a tad redundant in that respect. Like almost all new releases, there are bugs lurking; otherwise, Hand-Off is filled with clever touches and good design.

On Cue II 2.0

ON CUE USED TO BE A SIMPLE FILE launcher like Hand-Off's Launch menu. The new version (Icom Simulations, \$99.95) is loaded to the gills with features (1, 2, 5, 6, and 8)—and more. An extension manager lets you decide, as the Mac is starting up, which extensions (INITs) you want to load; a DiskTop clone, which lets you view technical info about any file; and a clone of Now Utilities' Super Boomerang places pop-up menus inside the Open and Save dialog boxes of your programs. These pop-ups list recently opened items, and also offer a Find function.

Quick Finder, one of On Cue's pieces, is a bit of genius: it's a neat list of every program you've got (feature 9). Double-click on a program to launch it. You don't have to know what folder it's in, what disk it's on, or anything. Better still, you can change the list to show only Word files, only control panels, or whatever.

Unfortunately, On Cue is still too fragile for my taste; load its extension in the wrong order, or own one piece of incompatible software, and it bugs out. A fix is in the works and should be released by the time you read this.

Now Utilities 3.0.2

OVER THE YEARS, NOW UTILITIES has appropriated many of the good ideas of its rivals; the

current package (Now Software, \$129) gives you features 1, 2, 4, 5, 7, 8, and 9—plus an alarm clock, autosaver, extension manager, and so on.

Another cold reality for Now's competitors: after several years of refinement, these utilities are nearly bug-free and guaranteed to work together. The crown jewel is Super Boomerang, which is nearly impossible to describe in one sentence. Suffice to say that it puts a list of recently opened items every place you look—in the Apple menu, in Open and Save dialog boxes, and even as a submenu under Open in your programs' File menus. With its lightning-fast Find command, Now Menus (providing features 4 and 7), Multi-Master (features 2 and 9), and the other miscellaneous modules in the package, Now Utilities is a lot of highly polished bang for the buck.

MasterFinder 1.2

AFTER SPENDING HOURS WITH THE manual, I thought this Finder-replacement program was the planet's biggest dog (Olduvai Corporation, \$149). It seemed confusing and buggy.

Then Olduvai sent me a draft of the fine new manual, and suddenly light dawned. MasterFinder turns out to be a rather good idea. The premise: you see four tall, thin windows, or "panes," each showing the contents of one folder or disk. (According to my friends who know this kind of thing, the interface resembles

the one on the Next computer.) You can briskly collapse these directories and open others; copy, move, trash, and rename files; and find all files whose names contain, say, the word *Mac* in a fraction of a second. MasterFinder gives System 7 a real lift because in this era of bloated, sluggish software, it's light and fast.

However, even if you can live with permanent list view (and four windows, max), there are a few things MasterFinder doesn't do better than the Finder; for example, ⌘-O doesn't open a file, and Get Info on an alias doesn't have a Find Original button. On the

continues



*Finders,
launchers, file
managers—
which are
the keepers?*

Features Key

1. Fast file-finding
2. Application launching
3. Application substitution
4. Hierarchical Apple menu
5. Tracks recently opened files
6. Launches grouped files/programs all at once
7. Can make menus drop without their being clicked on
8. Switches sound and monitor color levels for specified programs
9. Provides pop-up list of all applications, for fast launching

other hand, power users may well get quite a charge out of MasterFinder (it sends Apple events, edits type and creator codes, and so on), and it offers features 1, 2, and 5. Just don't go near it until the new manual is ready.

Workspace 1.0

THIS FINDER REPLACEMENT BURSTS with creativity and new ideas. Instead of square icons on a gray desktop, Workspace (Ark Interface, \$149) gives you a bright, beautifully drawn, 3-D picture of an office (and features 2 and 5). Instead of in folders, all documents for a particular project are kept in a portfolio, which you drag to a cabinet when you're not using it. Programs are stored in binders on a shelf; to use one, you drag a binder to the table, where it inexplicably changes into a tool (like a pencil or a telephone); to launch a program, you double-click on a tool.

The idea behind Workspace is that this massive expansion of the desktop metaphor ought to be easier to understand than the Finder, particularly for the beginner. (And the fact that Workspace places new files into the open project folder automatically is brilliant—you never lose things.) But Workspace doesn't let you copy files from disks, find things, compare folder contents, or put things in the Trash. These must still be accomplished in the regular Finder. So rather than learning Workspace *instead* of the Finder, the novice must learn Workspace in *addition* to the Finder. Alas, a new idea isn't always a better one.

Tiles 1.0.1

I JUST DON'T GET TILES (CE SOFTWARE, \$99.95). When this application is running, you can create a clickable icon for any program, file, or QuicKeys macro. You can arrange these icons in a window, or place them on the desktop—but when you quit Tiles, the icons disappear.

Yes, it's nice that you can launch a group of things with one click (Tiles has features 1, 5, and 6)—though this feature doesn't work with DAs. But look, if you want a program that launches files when you double-click on an icon, I know one you can get for free: the Finder. Why buy something that *adds* clutter to the screen?

DiskTop 4.0.2

CE SOFTWARE MORE THAN REDEEMS itself with this potent desk accessory (\$99.95). It's a one-window, list-view, virtual Finder with features 1 and 2. Except for the fact that it has no icon view, it does everything the Finder does, and more (such as being able to find, list, or delete all Word files created last week; or letting you edit creator codes, if you're into that techie stuff). I don't see how System 6 users can survive without it, although ready access to the Finder in System 7 (or MultiFinder) makes DiskTop slightly less relevant. The fact that it can often copy a file from a floppy disk that the Finder claims has a "disk error" is a happy bonus.

QuickTools 1.0

POWER STRIP, PART OF THE QUICK-Tools set (Advanced Software, \$79.95), is a vertical palette of program icons you click on to launch. A pop-up menu on each tile lists the documents that are tied to that application.

It may sound like Tiles, but it's faster, simpler, and isn't an application unto itself. The strip nestles neatly against the side of the screen; with a click, you can collapse it into a tiny handle, out of your way until you click again. It truly is easier to launch a program (or, if it's running, bring it to the front) with a single click on an omnipresent palette rather than use menus (as with Hand-Off and its ilk).

There's something unfinished about Power Strip, however; it can't be rotated,

program icons have no labels, and all desk accessories appear with a generic suitcase icon. That's too bad; you can add anything in the System 7 Apple menu (folders, documents) to the strip, but since to Power Strip they're all desk accessories, they all appear with the same darned suitcase icon (and only part of their name). When files, folders, and DAs have their own icons (as they will in a planned upgrade), I'll leave this half-inch-wide bit of handiness on my screen all day long.

Kiwi Power Windows 1.5

AN UNDISCOVERED GEM FOR SYSTEM 7 users only (Kiwi Software, \$79.95). This extension puts a permanent menu on your menu bar. Its commands are descriptions of window arrangements: Even Tall, Duo Wide, and so on. Each command rearranges all the windows on your screen into a gorgeous layout: tiled, stacked, side by side, whatever—even if several programs are running. You can also tell KPW to memorize a configuration of windows that you've set up by hand.

KPW can even memorize the documents and programs in the windows as "work sets," which can be launched as a group, qualifying KPW for features 2 and 6. KPW can pop a work set into your Apple menu for super-quick multiple-document launching. (The sole disappointment: work sets can't launch desk accessories.) The manual is so well written it's almost poetic. KPW 1.5 even comes with a polished-up version of the former shareware HAM clone, BeHierarchic 2.1, so you get feature 4, as well.

The Upshot

ALMOST EVERY PRODUCT HERE MESSES with the Finder, and thus is incompatible with something or other. And these products are certainly incompatible with each other. Unless you think system crashes make life more eventful, buy with care.

Though individual features are better in other packages, it's my duty as a critic to point out that you can get almost all nine features in Now Utilities. At this writing, its utilities are the most stable, have the best price per module, and are guaranteed to work together. Furthermore, you can install these doodads individually—they're not all crammed into one gnarly superextension. Between Super Boomerang, MultiMaster, and Now Menus, you may never double-click on an icon again. **m**

See *Where to Buy* for contact information.

Contributing editor DAVID POGUE wishes to reassure the reader who wrote to ask if the Desktop Critic is "over the age of 18, judging by the photo." David is 29.



Launch Heaven Five Finder-killers at work, clockwise from upper left: HAM doing its Apple menu thing; QuickFinder (part of On Cue II) listing all programs; Hand-Off II's menu listing programs and documents in its small-font mode; MasterFinder showing the contents of three hard disks (and a folder) at once; and, in the background, the colorful world of Workspace.

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EDITED BY EVAN COOPER

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BY MACWORLD.
ALL PRICES
ARE SUGGESTED
RETAIL. PLEASE CALL
VENDORS FOR
INFORMATION
ON AVAILABILITY.

HARDWARE

2400 Plus V.42 Fax Modem

A 2400-bps data modem that supports V.42bis and MNP 5 data compression and MNP 2 to 4 and MNP 10 error corrections; also supports Group III, Class 1 and 2 fax standards and can send and receive faxes at 9600 bps. Requires cable, which is available for about \$20 from computer stores to connect to a Mac. \$279. Ven-Tel, 408/436-7400, 800/538-5121; fax 408/436-7451.

Axion Switch

An electronic switch that connects to a serial port and allows three serial devices to be connected to a port at the same time. The user can switch between the devices through the Control Panel; one of the devices is assigned as the default device, which is automatically chosen at start-up. \$159. Axion, 408/235-0227; fax 408/247-3673.



Axion Switch

BC 250

A standby uninterruptible power supply designed to provide 250va. of power to computer devices during brownouts, blackouts, and other power problems. The product has two spike-protected AC outlets plus AC power and battery-indicator lights. \$139. Tripp Lite, 312/329-1777; fax 312/644-6505.



BC 250

BookEndz

A docking station for the Mac PowerBooks that allows the user to connect to printers, external hard drives, network nodes, and other peripherals. The BookEndz unit attaches to the peripheral connectors; the user can access all the



BookEndz

devices by sliding the back of the PowerBook into a station—making one connection. Model BE100 for PowerBook 100 \$149; model BE147 for PowerBook 140 and 170 \$179. Pilot Technologies, 612/828-6002, 800/682-4987; fax 612/828-6806.

ComputerEyes/RT

A video-digitizing device that lets the user capture still images in 24-bit color in as little as 1/30 of a second from NTSC composite or S-video sources. The SCSI device can capture video samples at a resolution of up to 640 by 480 pixels and has an on-

screen live-action preview window. Adjustments can be made to an image's brightness, contrast, and color levels, and captured images can be saved in PICT and TIFF formats. The product has 921K of video memory and a 32K color lookup table. \$599.95. Digital Vision, 617/329-5400; fax 617/329-6286.

DaynaPort SCSI/Link

An external SCSI Ethernet adapter for use with PowerBooks and other Macs that have no internal slot for an Ethernet board. The product has two 25-pin SCSI connectors, has an external termination switch, and comes with a 12V power supply. The adapter is available with a BNC connector for thin wiring, or an RJ-45 connector for 10BaseT wiring. SCSI cables are available separately with either 25-pin or 30-pin connectors to support either PowerBooks or desktop Macs. \$399. Dayna Communications, 801/531-0600; fax 801/359-9135.

DesignJet

A 300-dpi monochrome raster printer/plotter that prints 6 pages per minute and can take 24- and 36-inch-wide rolls of paper up to 150 feet long. To work with a Mac the printer requires a software



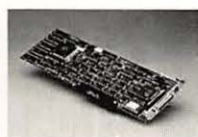
DesignJet

printer driver that converts QuickDraw text and graphics into the DesignJet's HPGL/2 command

language. \$10,995. Hewlett-Packard, 408/973-1919, 800/752-0900; fax 208/344-4809.

Digital Waveboard

A NuBus board that provides 16-bit, four-track, direct-to-disk, random-access audio recording. The board requires the company's Digital Performer software (\$895), which provides MIDI sequencing functions and has on-board AES/EBU and SPDIF digital input and output; the built-in digital bus allows direct connection with any DAT recorder or stand-alone A/D-D/A converters. The product records



Digital Waveboard

at 44.1kHz (the standard for CDs), 32kHz, and 48kHz, and is based on a Motorola 56001 processor running at 20MHz. \$1495. Mark of the Unicorn, 617/576-2760; fax 617/576-3609.

Go-80

An internal, 2.5-inch Quantum SCSI hard drive with an 80MB capacity for use in the PowerBook 100, 140, and 170. The mechanism has an average seek time of 19ms and a sustained data-transfer rate of 1.5MB per second, according to Quantum. The product comes with Alliance Peripherals PowerTools



Go-80

software as well as a four-page installation pamphlet with photographs. \$599. APS, 816/478-8300, 800/235-2752; fax 816/478-4596.

HubWorks-8

A stand-alone Ethernet hub with eight RJ-45 ports for connecting to 10BaseT Ethernet lines, a BNC connector for thin Ethernet, and an AUI connector for thick Ethernet. The box is configured for thin or thick Ethernet via a switch on the front panel; there are also three LED status lights per port for indicating collisions, link integrity, and polarity reversal. \$399. TechWorks, 512/794-8533, 800/688-7466; fax 512/794-8520.

HyperSpace Shuttle

An optical storage device based on the HyperSpace rewritable optical drive that holds up to five ISO-standard removable 5.5-inch, 650MB cartridges to provide up to 3.25GB of online storage. The drive's



HyperSpace Shuttle

robotic mechanism takes 6 to 8 seconds to switch cartridges, and the drive itself has an average seek time of 28ms, according to the company. The included software allows for disk locking, password protection, and automatic cartridge mounting; each individual cartridge appears on the desktop as two icons (one for each side of the disk) and can be accessed like any standard Macintosh volume. Limited file-sharing capabilities are available with

the current software, and future upgrades will include greater network support. \$7990. Ricoh Corp., 408/432-8800, 800/955-3453; fax 408/943-9364.

LabelWriter II Plus

A desktop printer with a 138-by-138-dpi resolution specifically designed to print labels for envelopes, packages, file folders, notebooks, and so on. The product's print head is 2 1/4 inches wide and can print on a variety of label sizes, from 1 1/8 by 3 1/2 inches to 2 1/4 inches by 4 inches; it also prints 3 1/2-inch disk labels. The printer comes with addressing software for laying out labels. \$399. CoStar Corp., 203/661-9700, 800/426-7827; fax 203/661-1540.

LZR 1560

Series of 400-dpi laser printers that accept paper sizes up to 11 by 17 inches and come with one, two, or three paper trays. The printers produce 15 pages per minute and are equipped with AppleTalk, RS-232, Centronics Parallel, and SCSI ports. All models have



LZR 1560

PostScript Level 2, RISC-based controllers and feature 4MB of RAM, expandable to 16MB. Each paper tray holds up to 250 sheets. Single-tray model \$5695; double-tray \$6495; triple-tray \$6995. Dataproducts Corp., 818/887-8000, 800/334-3174; fax 818/887-4789. continues

mira 35

A single-pass color slide scanner that scans positive or negative 35mm slides or film at a 2700-dpi resolution. The product captures up to 30 bits per pixel and 10 bits of dynamic range per color, and then optimizes the image to 24 bits. The company's Virtual Scanner Interface software, an Adobe Photoshop plug-in that displays images in real time as they are scanned, is included. \$2695. Santos Technology, 310/320-8888, 800/966-9960; fax 310/212-6688.



mira 35

Niscan Spectra

A single-pass scanner that scans 24-bit color and 8-bit gray scale in a single pass and has a scan area of 4 by 6 inches.



Niscan Spectra

The product has five gamma-correction settings and seven brightness selections, and connects via a serial port. It ships with the company's Scan-Do desk accessory for adjusting scanning settings. The software supports TIFF, PICT, MacPaint, and EPS file formats. \$995. Nisca, 214/242-9696, 800/245-7226; fax 214/245-0942.

Notebook Display Adapter 030

An internal, 8-bit display adapter for the PowerBook 140 and 170 that drives 12-inch and 13-inch color displays in 8-bit mode, 15-inch and 16-inch displays in 4-bit mode, and 21-inch displays in monochrome mode. The adapter plugs

into the memory-expansion slot and can be configured with up to 4MB of pseudostatic RAM for a total of 8MB of memory. \$795; with 2MB of PSRAM \$1195; with 4MB of PSRAM \$1595. Envisio, 612/339-1008; fax 612/339-1369.

Ovation sx

An active matrix LCD projection panel that can display more than 24,000 colors, and can also display live video in NTSC, PAL, or SECAM format with the addition of a video adapter that is priced at \$695. The Ovation sx includes a re-



Ovation sx

mote control that can access all the device's functions and can emulate keyboard strokes. \$6195. Proxima, 619/457-5500, 800/447-7694; fax 619/457-9647.

PhoneNet StarController PN357 and PN377

Two multipoint repeaters that include Farallon's StarCommand software, allowing any number of hubs to be managed from one Mac anywhere on the network. The PN357 has 12 LocalTalk ports, and the PN377 has 24; both hubs automatically turn off troubled sections of a network and use unshielded twisted-pair (UTP) wiring. Network managers can also use out-of-band management, which lets them access a hub even if the whole network is down. PN357 \$1495; PN377 \$1895. Farallon Computing, 510/596-9000; fax 510/596-9020.

R45 Plus and R90 Plus

Two half-height 5 1/4-inch removable-cartridge drives with capacities of 44MB and 88MB respectively, and an average access time of 20ms and a data-transfer rate of up to 10Mbits per second, according to the company. Drives ship with MacTools

Deluxe from Central Point Software, which includes nine utilities for disk and file management. The drives' microprocessor performs diagnostics and automatic error detection and correction. R45 \$729; R90 \$999. Rodime Systems, 407/391-7333, 800/227-4144; fax 407/391-9958.

RISC Router 3000E

A RISC-based two-port Ethernet-to-Ethernet gateway and router that supports AppleTalk, TCP/IP, and DECnet networking protocols. Other features include the Enhanced Network Security protocol for providing password protection, and management software that offers extensive network diagnostic and configuration abilities. The basic model includes two Ethernet ports, which are independently configurable for thick- or thin-wire operation; 1MB of RAM; and 256K of Flash EPROM. Basic model \$2995. Compatible Systems Corp., 303/444-9532, 800/356-0283; fax 303/444-9595.

Sportster 14,400 Mac & Fax

A fax-and-data modem with a 9600-bps Group III fax-transmission rate and a data-transmission rate of up to 14,400 bps with V.32bis. The product supports V.42 error control, V.42bis and MNP 5 data compression, and MNP 2 to 4 error control. \$599. U. S. Robotics, 708/982-5010, 800/342-5877; fax 708/982-5235.

Unity 1000 Plain-Paper Typesetter

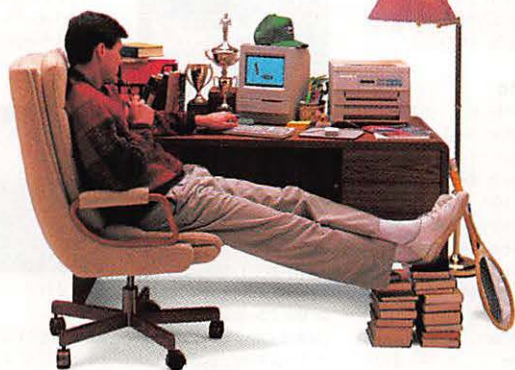
A 1000-dpi plain-paper typesetter with an internal hard drive containing 135 preinstalled PostScript Type 1 fonts. The typesetter uses TurboRes



Unity 1000 Plain-Paper Typesetter

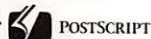
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Shared office. Shared printer. Now here's the right match for one Mac or many. In fact, the 16 ppm microLaser XL is a natural fit for an AppleTalk® network. And like its slightly smaller cousin, this workhorse printer offers you either 17 or 35 scalable fonts, priced at \$2,899* and \$3,249*, respectively.

tains a 40MHz proprietary processor, has 32K of fast SRAM cache, comes with 9MB of RAM expandable to 48MB, and offers automatic port-switching through the company's HotPorts technology. The device's PostScript language and PCL4 interpreters make it compatible with Type 1, Type 3, TrueType, and Hewlett-Packard soft font formats. Built-in TurboGray technology improves the appearance of halftone images by providing increased gray levels at higher screen frequencies. \$6995. LaserMaster Corp., 612/944-9330, 800/950-6868; fax 612/944-0522.

SOFTWARE

Academic Edition of Lotus 1-2-3 for Macintosh

A version of 1-2-3 for the Macintosh that will be sold only in college bookstores and through education resellers; costs substantially less than the commercial product. Academic lab packs, which

include ten licenses for the software, one set of documentation, and three quick-reference manuals, are also available. Software is identical to the commercial version. 2MB min. memory. \$99; lab pack \$500. Lotus Development Corp., 617/577-8500, 800/343-5414.

Bill's Tropical Decorations

A Type 1 PostScript picture font that provides more than 150 symbols taken from architectural details, postcards, menus, and other sources created in the Tropical



Bill's Tropical Decorations

Deco style. The package includes 26 pairs of fists and hand-pointers. 1MB min. memory. \$29.95. U-Design Type Foundry, 203/278-3648, 800/945-3648; fax 203/278-3003.

CBE MultiMedia Sequencer

A sequencing program written in HyperCard that allows a user to create stacks for controlling full-motion and still-frame images from a laser disc player, digitized sounds, and graphics files. 2MB min. memory. \$129. Media Tech, 708/426-7584; fax 708/888-8689.

Chronoscope: Exploring 1492

An interactive videodisc with navigational software designed for middle and high school social studies and history classes; it is the first of the Chronoscope series, developed jointly by Optical Data Corp. and the WGBH Educational Foundation. The videodisc contains 60 minutes of video taken from PBS documentaries and other PBS programs, and the material is organized as a curriculum focused on world cultures and encounters that took place in the age of European exploration. The Stories section provides short documentaries on seven topics about explo-



Chronoscope: Exploring 1492

ration, encounters, and legacies. 1MB min. memory. \$595. Optical Data Corp., 908/668-0022, 800/524-2481; fax 908/668-1322.

Digital Gourmet

A cookbook in HyperCard format that contains more than 1000 recipes compiled from a variety of sources. For each recipe the user can determine nutritional information, such as calories, fat, and protein content. The product ships with HyperCard 2.1 and lets the user search for recipes by ingredient, modify and add an unlimited number of recipes to the database, mark favorite recipes, and clarify words with a dictionary of cooking terms. All recipes can be printed. 2MB min. memory. \$69.

TeleTypesetting Company, 617/734-9700; fax 617/734-3974.

Fast Eddie

A color and gray-scale image-conversion utility based on the company's proprietary Magenta Process, which converts 32-bit or 24-bit images to 8-bit files using an optimal 8-bit palette; the product allows the user to view and manipulate high-resolution images using 8-bit hardware. The company claims the process reduces the image file to one-third its original size. Converted images can be saved in PICT, TIFF, Sun Raster, TARGA, or MacPaint format. 5MB min. memory. \$169. Paradigm Concepts, 505/888-0112; fax 505/888-0114.

Letter Ideas

This desk accessory, which runs on top of any word processor, contains a thesaurus of thousands of phrases commonly used in business letters. The phrases are divided into four categories: initiating, message, action, and closing. The writer

scans word group combinations to find a phrase that suits the intended message and tone. The package includes Letter Ideas Editor, which allows the user to customize the thesaurus file. 1MB min. memory. \$125. ia Software, 309/833-5959, 800/676-9304; fax 309/298-2520.

MacHam

A program that generates tests designed to prepare amateur radio users for the code-free Technician Class Amateur license test. The product contains all 700 possible FCC test questions and generates FCC-style exams that can be taken on screen or in written format. The subject matter is broken into nine sections for both the novice and technician parts of the actual exam. 2MB min. memory. \$34.95. National Amateur Radio Association, 206/869-8052; fax 206/861-5780.

MacLAN Connect for Netware

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Mac and microLaser. The perfect pair. Whichever microLaser you pair with your Mac, there are bonuses microLaser offers that other printers can't. Like easy-to-use controls and upgrades you can do yourself — without tools or technicians. And because it's compatible with the Apple LaserWriter[®], microLaser works like it

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integrating Macintosh and PC networks that allows Mac and Novell NetWare users to share printers, file servers, and other network resources. The software runs on a dedicated PC, turning it into an AppleShare server; Macintosh users can then see PC files as Macintosh icons, and PC users can see Macintosh files with standard PC names. A Macintosh user can also open a PC file and run the associated application by double-clicking on the file's icon. 1MB min. memory. \$695 for 40 users. Miramar Systems, 805/966-2432; fax 805/965-1824.

MacPing

A testing program for AppleTalk networks that can troubleshoot up to 60 computers simultaneously and determine which part of the network is experiencing trouble. 1MB min. memory. Single-user version \$69; unlimited-user version \$149. Dartmouth Computing Services, 603/646-2643; fax 603/646-2810.

MicroMath Calc

A program that runs as an application or a desk accessory that functions as a sophisticated calculator that can work with many types of numbers, including real, complex, Gaussian, binary, and hexadecimal numbers. The DA has hundreds of units of measure and physical constants for use in conversions built in, and it can parse algebraic expressions written in long form. The Standard Apple Numerics Environment (SANE) is used throughout the program, and many arithmetic, logarithmic, and trigonometric functions are provided; basic financial and statistical functions are also included. 512K min. memory. \$99. MicroMath Scientific Software, 801/943-0290, 800/942-6284; fax 801/943-0299.

Minotaur, The Labyrinths of Crete

A game for play over a network or by modem that can have up to seven players at a time. The players are put into a randomly generated laby-



Minotaur, The Labyrinths of Crete

rinth and, with the aid of a variety of objects found in the maze, attempt to kill their opponents. There are more than 80 different items in the maze that the players can use, including weapons, spells, magic, and armor. The program runs in 8-bit color and comes with two master disks. 2MB min. memory. \$89.99. Bunge Software Products Corp., 312/493-2849; fax 312/493-4557.

OPTS

An application that translates documents written using Unix troff, nroff, or mm macro-package document formats into RTF documents (used by Microsoft Word and WordPerfect) for use on a Mac or a DOS machine. The program automatically determines which format the document is in and

converts it accordingly; it can also convert from RTF format to Unix format. 1MB min. memory. \$179. Systems Design Associates, 908/730-7677, 800/497-1732; fax 908/730-6966.

Paris Book of Hours

The fifth volume in a series of PostScript clip art containing medieval and Renaissance images, this volume contains images (saved as EPS files) based on sixteenth-century French woodcut lettering and typographic orna-



Paris Book of Hours

ments from the *Paris Book of Hours*. The package includes initial letters, decorative elements, typographic borders, and grotesques. 1MB min. memory. \$90. BBL Typographic, 137 Narrow

Neck Rd., Katoomba, NSW 2780, Australia.

PersonToPerson

A point-to-point messaging and communication system for use over a network; sends voice-mail messages, has an in-out board, and provides a Post-it Note window for leaving messages on other users' screens while they are out. The program loads as an INIT, and users can create and store messages while not connected to the network. 1MB min. memory. Two-user pack \$149; ten-user pack \$399; unlimited users \$699. Asanté, 408/752-8388, 800/662-9686; fax 408/734-4864.

Rotate This

An addition for Aldus PageMaker 4.2; allows a user to rotate a bitmap counterclockwise to any degree specified. Images can be flipped left to right or top to bottom. The software does not manipulate text. 3MB min. memory. \$49. Equilibrium, 415/332-4343, 800/524-8651, dept. E5; fax 415/961-4201.

RVC for Macintosh

An application that converts raster-based (bit-mapped) images into high-resolution scalable vector images for use in desktop publishing and other applications. 1MB min. memory. \$1490. ScanVec Marketing, 508/694-9488, 800/866-6227; fax 508/694-9482.

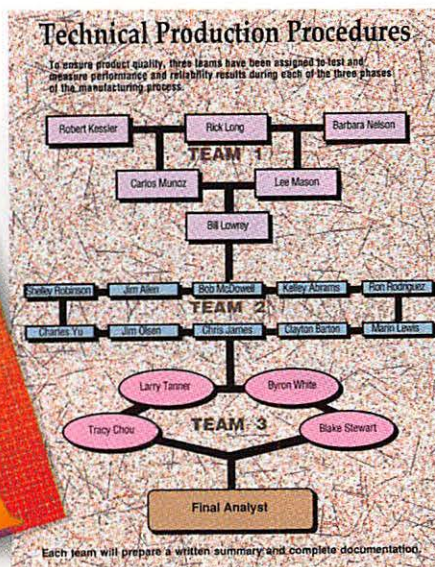
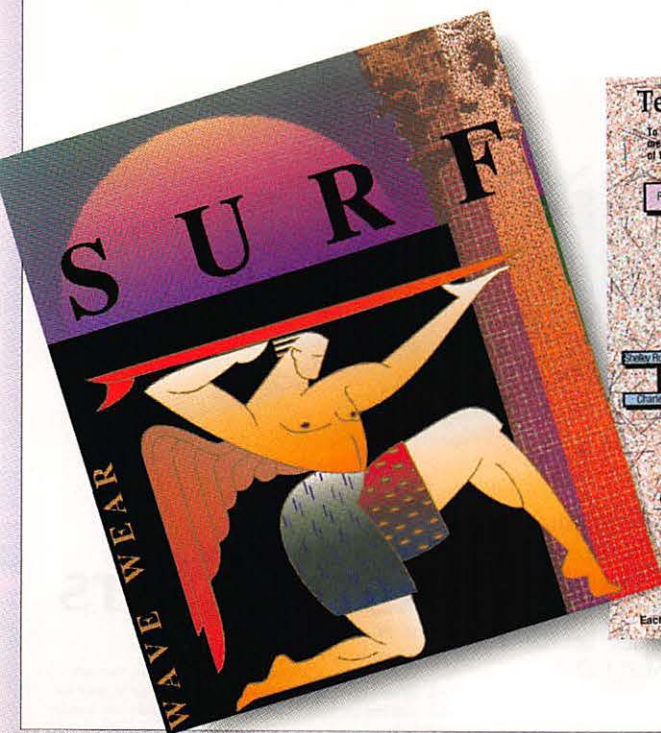
Science CAP

A HyperCard program that assists teachers in preparing classroom science activities for children in grades five through eight. The product is a collection of more than 500 files containing diagrams, worksheets, science-related activities, overheads, teaching forms, quizzes, and answer sheets. The nine featured topics are Animals, Astronomy, Brain and the Mind, Cells, Chemistry,



Science CAP

It's a graphics program. It's a business program. Is not.



Geology, Lab Skills, Pro-
tists, and Weather.
Graphics and text files
are saved in MacPaint
and Microsoft Works for-
mats. 2MB min. memory.
\$499. Demco, 608/241-
1201, 800/356-1200; fax
608/241-1799.

SurfGuard

An application that backs
up to cartridge tape
drives, digital audiotape
drives, 8mm helical-scan
subsystems, magneto-
optical disk drives, or any
other Hierarchical File Sys-
tem (HFS) volume. Back-
ups can be performed on
a user's local hard drive or



SurfGuard

on volumes on an Apple-
Share file server. 1MB
min. memory. \$99. Surf
City Software, 714/289-
8543; fax 714/289-1002.

UK Network

A HyperCard stack that
lets users explore the ca-

reers of 145 English blues,
rock, and pop bands from
the sixties to the nineties.
Each section on a band
contains detailed bio-
graphical information, a
discography, and a gene-
alogy that is linked to
other entries. The pro-
gram also includes UK
Network Trivia, a game
based on the information
in the stack. 2MB min.
memory. \$27.50. Music
Society, 416/282-8810.

Word-A-Day Daily Planner

A daily calendar and
planner that displays a
new vocabulary word
each day and challenges
users to choose the cor-
rect definition; points are
awarded for correctly
defining a word. The
planner portion of the
program lets the user
view calendars by day,
week, month, or year,
and print each view in
a variety of sizes. From
one screen the user can
edit date, time, and
appointment informa-
tion. 2MB min. memory.
\$59.95; also available
as an add-on to the Far
Side Computer Calen-

dar for \$19.95. Amaze,
206/820-7007; fax 206/
823-0568.

XTension Manager

A QuarkXPress XTension
for controlling the loading
of XTensions when Quark
is launched or after the
application is running;
users can define a default
set of XTensions and save
other sets for later use.
3MB min. memory. \$69.
DK & A, 619/488-8118;
fax 619/488-4021.

CD ROMS

ProArt Professional Art Library Portfolio

A collection of clip art in
EPS format that includes
over 3000 pieces of art in
more than 50 categories;
the art is designed to be
used in presentations,
publications, and newslet-
ters. The CD also includes
a run-time version of
Multi-Ad Search and a
catalog of the images with
keyword-searching ca-
pabilities. 2MB min.
memory. \$595. Multi-Ad
Services, 309/692-1530,
800/447-1950; fax 309/
692-5444.

SpaceTime and Art

A collection of materials
on the subject of outer
space with more than
300 high-resolution 24-
bit color images in PICT,
TIFF, and EPS formats; an
annotated database of
astronomy organizations;
education-al institutions;
space-related publica-
tions; and QuickTime
movies on recent theories
about the creation of the
universe. The CD also
contains HyperCard refer-
ence stack on current cos-
mology concepts and a
tutorial on graphics ter-
minology, compatibility,
and technical issues. 1MB
min. memory. \$199.
Wayzata, 218/326-0597,
800/735-7321; fax 218/
326-0598.

ACCESSORIES

MacBlaster

A pair of amplified desk-
top speakers for use with
a Mac that can be con-



MacBlaster

nected through the sound
port. The speakers, which
are 4 inches in diameter,
are designed to provide
full coverage of the entire
frequency range available
on the Mac sound chip.
\$89. Thor Manufacturing,
702/324-6600, 800/
346-4694.

MacShield

A line of computer moni-
tor shields designed to
reduce ELF and VLF emis-
sions from the displays on
all Mac compact models,
the Apple 12-inch and
13-inch RGB displays,
Apple's Portrait display,
the Apple 12-inch mono-
chrome display, the Seiko
14-inch RGB display, sev-
eral monitors from Super-
Mac and RasterOps, and
the Sony 14-inch RGB
display. \$99. Environmen-
tal Services & Products,
303/442-2578; fax 303/
442-0670.

Moustray

A device that attaches to
the edge of a desk, de-
signed to act as a shelf for
a mouse or other input
device; installation re-
quires no tools and the
product is designed to let



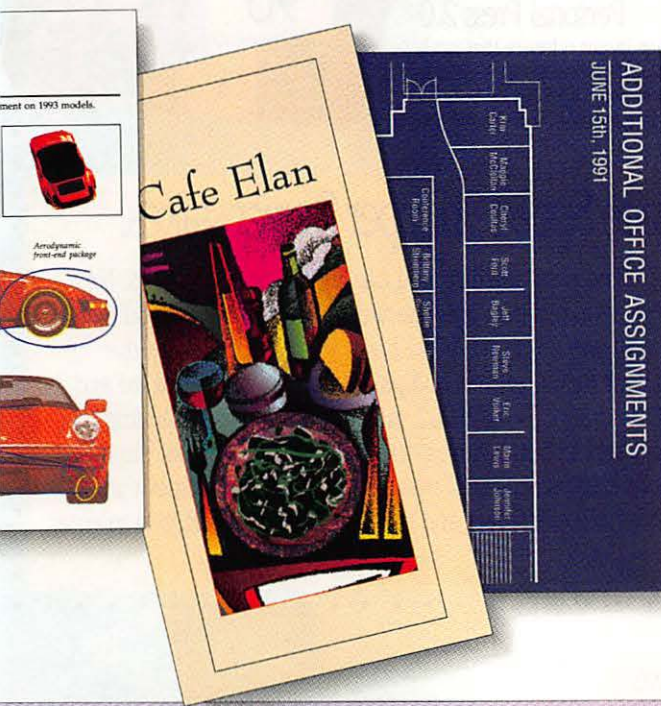
Moustray

a user use the input
device without bending
the wrist. A variety of
models are available for
desktops of different
widths. \$19.95. Work-
space Solutions, 801/
429-3795, 801/484-
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New Aldus SuperPaint 3.0.



(Suggested retail price \$109.)

Let's put this argument to
rest. It's both. SuperPaint®
is the all-in-one program that
makes it easy to do it all—
combining paint, draw, and
image enhancement—saving
you time and money.

As you can see, its range of capabilities makes it
perfect for either business users or graphic designers.
And now with the added color capabilities, EPS
import and export, textures, and gradients, it gives you
even more creative options (by the way,
it still works great in black and white).

Of course, the best way to settle any
argument over SuperPaint is to try it.

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See listings under
Hard Drives

DP + Hard Drives

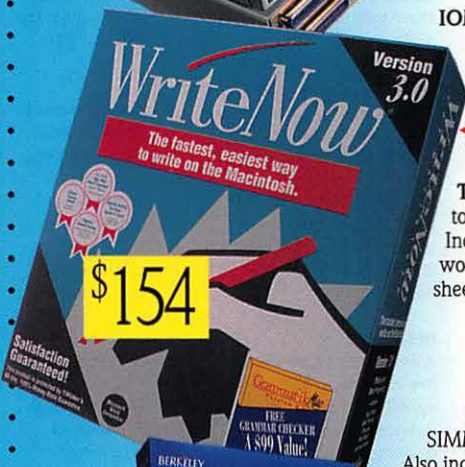
DataPlace 70 Available only at Mac's Place! These quality Quantum hard drives and Syquest Removable Cartridge drives come with DataWare formatting software, Alysis Software's More Disk Space and Central Points MacTools Deluxe. Each drive features a selectable SCSI ID switch, two 50 pin SCSI connectors, an external fuse and two AC Plug-ins.



\$698

Bernoulli Transportable 90 MB

IOMEGA 70 Long known for reliability, IOMEGA now offers fast, 19 millisecond access time, and affordable removable storage with a 5-year warranty. Durable in design and built for speed.



\$154

WriteNow 3.0 w/"Grammatik"

T/Maker 70 Fastest word processor for the Mac. Latest upgrade to the 2-time winner of MacUser's Best New Word Processor award. Includes lightning-fast, 135,000-word spelling checker, a 1.4 million word thesaurus DA and the most powerful, yet easy to use style sheets. MS Word compatible.



\$35^{ea}

SIMMs

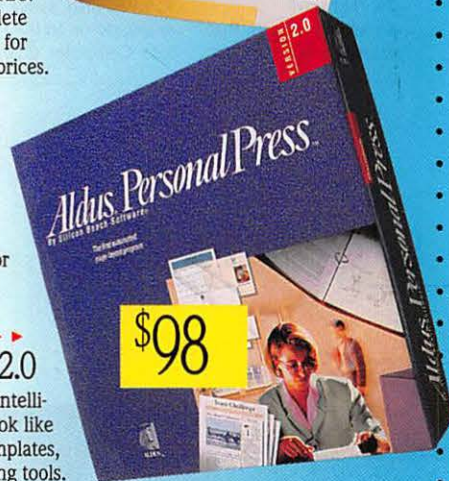
Mac's Place 70 Expand the mind of your Mac! One Meg SIMM, 80 nanoseconds, only \$35! Four Meg SIMM only \$128! Also included, Connectix Macintosh Memory Guide, the complete guide for RAM configuration, expansion, tricks and traps. Call for PowerBook RAM prices.



\$49

Kaboom and After Dark

Nova Development/Berkeley Systems 7 The ultimate screen saver meets the ultimate sound utility! Prevent screen burn-in with After Dark's Flying Toasters, colorful fish and other incredible displays. Energize your Mac with Kaboom!'s 150 wild and wacky sounds. You'll never settle for a simple beep again. If you love your Mac, you'll love this value-bundle!



\$98

Personal Press 2.0

Aldus 70 New Version! The only page layout software that intelligently assembles your text and graphics automatically so you look like an expert. Includes full featured word processing, "Intelligent" templates, Copy Fitting, AutoFlow, text wrap, free rotation, and drawing tools.

Here's the fine print for the Mac's Place Speed Shopper Sweepstakes.

*The first rule is to remember these dates: April 20 to July 31, 1992. Those are the days you can enter our sweepstakes. No entries will be accepted later. There are two ways to enter. Every time you place an order between the dates above, you'll be asked if you want to enter our sweepstakes. Obviously, the more times you order, the more times you'll be entered in the sweepstakes. If you're not ready to order, you can enter by writing your name, address and phone number on a postcard and sending it to: Sweepstakes Offer, Mac's Place, 8461 154th Ave NE, Redmond, WA 98052. All correspondence, including addressing, must be in your personal handwriting. No machined and/or electronic correspondence will be accepted. No mass/bulk mailing of any kind will be accepted. Please note that we cannot take sweepstakes entries over the phone without an order. Sweepstakes drawing will be held on August 14, 1992. Mac's Place employees and their families are not eligible to enter. Good luck!

Mac's Place

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Speed Shopper Sweepstakes. Enter Now.

Enter the Mac's Place Speed Shopper Sweepstakes any time from April 20 to July 31, 1992. Whoever wins the grand prize is going to have an amazing amount of fun. We'll fly you and a companion to our warehouse which is packed with sophisticated graphics programs, exciting games, state of the art CD ROM hardware, Fax/modems, business software, monitors, and even a **PowerBook 170**. Then a whistle blows and you're off, piling boxes in your shopping cart—tossing equipment worth hundreds—no thousands—of dollars in your backpack. Your goal is to take home as much as possible. When you're done, we'll whisk you and your companion to the Seattle area's elegant Woodmark Hotel for an all-expenses paid weekend of luxury. If you don't win the grand prize, don't despair. Second prize is a PowerBook 100 and a \$500 Mac's Place gift certificate. Third prize is a Mac's Place \$1,000 gift certificate. Order from this ad and we'll enter your name in the Sweepstakes. See rules for details.

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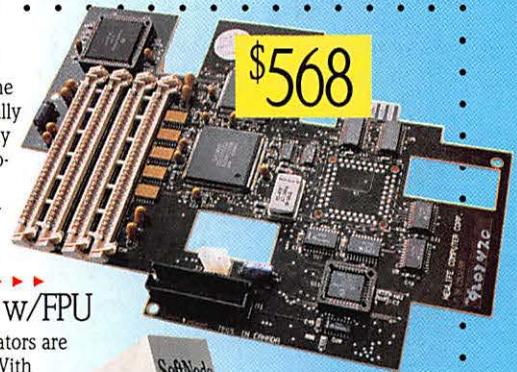
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BeagleWorks Competitive Upgrade

Beagle Brothers 7.0 Upgrade to where the true meaning of integrated software has finally been defined. Includes seven modules so fully integrated you can easily access the Word Processor, Database, Spreadsheet, Chart, Paint, Draw and Communications modules from anywhere in the program using revolutionary In-Contexting Editing™. Non-Upgrade price \$184.



\$568

Classic Accelerator! w/FPU

NewLife Computer Corp. 7 NewLife Accelerators are designed for performance without sky-high costs. With an Accelerator! installed in your Mac Classic, even the most demanding software won't slow you down. Imagine...the performance of a IIcx in the footprint of your compact Mac! Call for complete pricing on all NewLife Accelerators.

Voice Navigator SW

Articulate Systems 7.0

New! Voice Recognition is a reality now & affordable too! Provides Voice Recognition for ALL Mac Applications. Work faster & easier using your voice instead of key strokes & pulling down menus. Comes FREE with your choice of a high quality Desktop or Headset Microphone.



\$105/194

SoftNode 1.0/Universal SoftPC 2.5

Insignia Solutions 7 Add SoftNode to either Universal SoftPC or SoftAT and your Mac will run MS-DOS applications and share programs over a Novell PC Network! With SoftPC, your next IBM computer could be a Macintosh.

FolderBolt/NightWatch II

Kent Marsh 7.0 If you share a Mac with others, ensure privacy by using FolderBolt to lock files on your hard disk or floppy. A simple click of the mouse locks and unlocks folders. NightWatch II gives you the most ironclad hard disk protection in the industry. It offers three levels of protection - diskless, key disk and classic token disk. Impenetrable.

ThoughtPattern

Bananafish 7.0 Get organized and work more efficiently with ThoughtPattern, the information manager that lets you integrate notes and files. Features automatic cross-referencing, powerful searches, alarms, priorities and direct launching of other applications.

Painter 1.2 / 6 x 9 Tablet

Fractal/Wacom 7.0 Painter, the natural media painting program chosen by critics: MacUser Eddy 1991, 5-Mice, MacWeek's Target Award. The Wacom tablet has the premier pressure sensitive stylus. Now specially priced together.

DupLocator

Midnight Software 7.0

Finally!! Organize all your disks and files across any grouping of media. Build new organized disk(s) from your file collection. Delete, move, copy, color or archive/compress files. Locate/remove duplicate files by name, type, creator, size or by creation/modification date. Supports all Macs/networks.

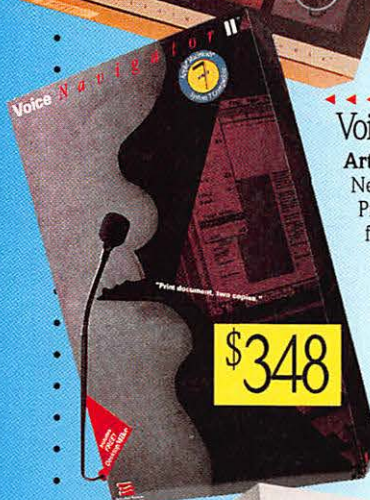


\$94

\$62



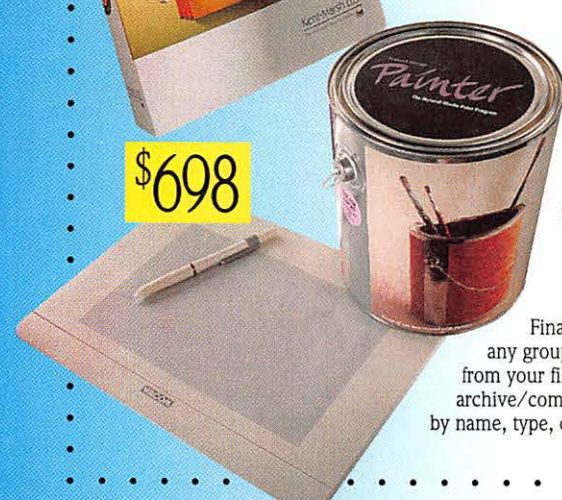
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\$348



\$69/89



\$698

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Ofoto

Light Source 7 Now professional quality gray scale scanning is as easy as the click of a button. Ofoto automatically scans, classifies, straightens, crops, and sharpens your image. You get a crisp accurate reproduction of your original image on the very first scan, leaving you more time to exercise your creativity.

\$278

ScanMaker 600ZS w/PhotoShop

Microtek 7 Create beautiful reproductions with vivid colors and extremely sharp definition. The latest color/grayscale flatbed scanner from Microtek. Scan at up to 600 dpi resolution at full 24 bit color. Easy to use controls allow adjustments of the scaling, resolution, brightness and contrast, shadow/highlight and more.

\$1,398

Cricket Graph/Cricket Draw III

Computer Associates 7 Cricket Graph - Quick and easy to use charting application ideal for anyone who needs to create graphs for reports, presentations or data analysis. Cricket Draw III - intuitive, object-oriented drawing program, produces professional-quality graphics. Both entry level and skilled users will appreciate it's ease of use and power.

\$84/168

LabelWriter II Plus

CoStar 7 Print labels easily and in all different sizes and shapes with the new LabelWriter II Plus! This palm-sized printer produces labels ideal for addresses, packages, diskettes, name tags, and Rolodex cards, you name it. Includes all you need for the all-in-one label printing solution.

\$298

MacUSA/MacGlobe

PC Globe 7 MacGlobe and MacUSA are the new state-of-the-art electronic atlas programs that deliver instant profiles of 190 countries and of all 50 states and Puerto Rico. Both programs are packed with maps, graphics and annually updated data. Easy to use, versatile, and affordable.

\$34/45

Control Classic

Diamante Software 7 MAKE MORE SALES! Combination database, wordprocessor and calendar provide unparalleled information management. Completely automates the process of sending follow-up form letters and phone calls. Prints fax cover sheets, speed memos, custom reports, labels and envelopes and much more. Received MacUser's highest rating for a contact management system!

\$298

Snooper

MAXA 7 Find problems fast with Snooper, the revolutionary suite of hardware diagnostic and testing tools. Snooper is easy-to-use, powerful and saves you time. No set of Mac utilities is complete without Snooper, the hardware diagnostic. Also available with Nubus diagnostic card for only \$168.

\$128

The Miracle Piano Teaching System

Software Toolworks 7 The first keyboard that teaches you how to play it! Makes learning even the basics a pleasure. Professional keyboard with 49 standard-sized velocity-sensitive keys, 128 digitized instruments and sounds, with full MIDI-compatibility. Includes hundreds of songs and lessons and full orchestral accompaniment.

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\$648

Access CD Allegro

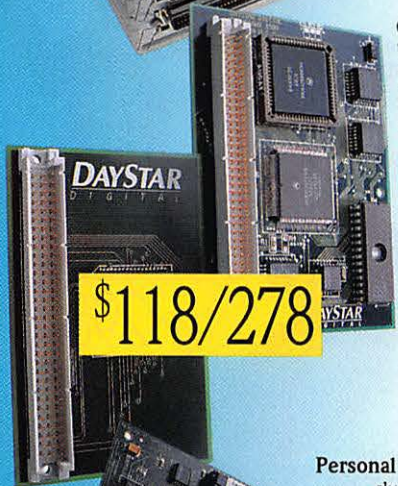
Optical Access Intl. 7 The fastest CD-ROM drive available with a 310 ms. access time. Includes SuperCache software for lightning speed access to large amounts of information. Features headphone jack, stereo RCA type audio connectors, and deluxe desk accessory. Includes cable, sample CD, and one caddy.



\$1,598

Access RD/Aria™

Optical Access Intl. 7 128 megabytes in your shirt pocket. This 3.5" optical drive is the cutting edge of technology, enhances with SuerCache software for lightning fast operation. The ultimate data security and affordability. Includes: cable, and removable 3.5" media cartridge (ANSI compatible).



\$118/278

Equalizer LC w/FPU/PowerMath LC/LC II

DayStar Digital 7 Equalizer LC — put a 16MHz 68030 into your '020 LC and gain as much memory as your hard drive will allow using Virtual Memory under System 7. Put a PowerMath chip card in your LC or LC II and boost your spreadsheet recalcs and math and science programs.



\$298/15ea

Training Modules for Word 5.0

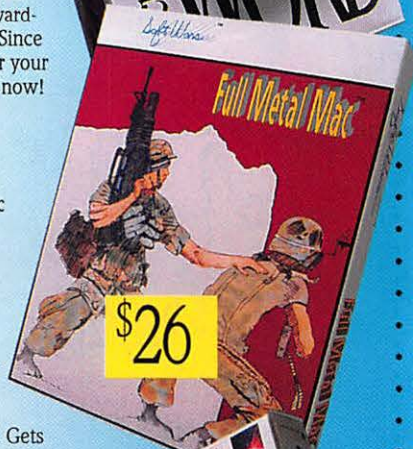
Personal Training Systems 7 MS Word 5.0 Training Modules. Special exclusive offer! Order Word 5.0 now and you can buy one of four, award-winning, audio tutorials for Word 5.0 from PTS for only \$15. Since they are modular you can select the appropriate level for your needs. Limited time only, call now!



\$158ea

EtherMac II-TN and 10T

Farallon 7 Available in every cabling type, and for every Mac bus. EtherMac C Combo cards come with connections for all cable types (Thick, Thin, or 10Base-T) and come standard with 64K Ram for data-intensive operations including server use and A/UX support. 5-year warranty. Call for pricing on full line.



\$26

Full Metal Mac

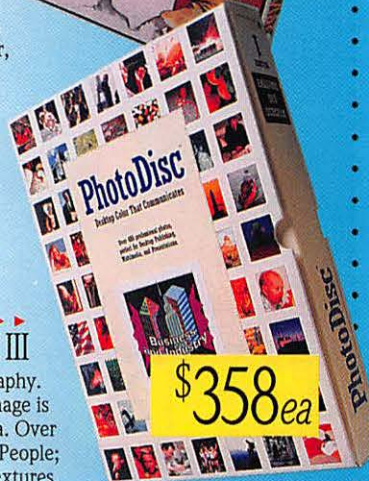
Soft Wars 7 Conflict simulation game that places each opponent in the role of a combat infantry officer in command of modern infantry elements. Gets down to the nitty-gritty of modern, small arms infantry combat - the sweat, fear, chaos, pressure and unpredictability. 1 or two players.



\$98

PersonToPerson (2-user)

Asante 7 Mac communication software system that mirrors "traditional" office interactions. Instead of shouting across the workplace, PersonToPerson allows users to send voice messages across the network. Includes an In/Out Board and a Post-It™ Note Window. Not file server or net-administration required!



\$358ea

PhotoDisc CD-ROM Vol. I, II, III

PhotoDisc, Inc 7 Incredible professional digital color photography. Compatible with PhotoShop and other DTP software packages. Each image is licensed for use in ads, newsletters, brochures, presentations and multimedia. Over 400 photos in every volume. Vol. I, Business & Industry; Vol. II, Lifestyles & People; Vol. III, Backgrounds and Textures.

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PROMotion

Motion Works 7 Easily create full color animations with multiple audio tracks, even if you can't draw. Interface follows traditional animation techniques such as cel based actors, onion skinning and path based motion. Other features include cel tweening and Print to Video. Export your animations to QuickTime™ or Berkeley Systems After Dark.

Infini-D/Replicas I & II

Specular Intl. 7 • **Infini-D** – Professional-quality, versatile, 3D graphics program with an easy-to-use integrated interface. Brings photorealistic images to your desktop! **Replicas Vol. I & II** – Ready-made amazingly photorealistic 3D clip art, in the Infini-D format, with detailed surfaces and textures. Simply copy and paste into existing scenes.



DiVA VideoShop

DIVA

DiVA VideoShop is a fun, easy and powerful application for creating and editing QuickTime movies. Used with any QuickTime digitizing board, **DiVA VideoShop's** recording module lets you record video and audio clips directly onto your hard disk. For ease of editing, **DiVA VideoShop** uses micons (moving icons) to represent each clip. You can incorporate clip media from the Image Bank CD Collection of 300 movies, 70 music scores, and a sound effects library, all included in the box. Call for Special RasterOps STV or SuperMac Video Spigot Bundle Pricing!



MacroMind Director 3.1

Macromedia 7 New Version! The professionals choice for multimedia production is now the ultimate QuickTime authoring tool. Author, edit, playback and export interactive QuickTime movies with no additional hardware. Other features include expanded help, added functionality in the Score, a \$195 Accelerator, and license free distribution of your multimedia productions.

Interactive Training - MacroMind Director

Media In Motion 7 The comprehensive computer-based interactive course designed to help individuals learn MacroMind Director in just one session! Complete instruction on Director 3.0 and 3.1 including all key components, cast creation, scripting QuickTime™ and more. Save time and guarantee your proficiency in using Director.



CameraMan

Vision Software 7 New! Make a full-color movie of whatever's happening on your Mac screen with **CameraMan**! Records all screen activity in real-time to a QuickTime™ or PICS movie. Use your screen movies in multimedia, presentation, and QuickTime™ packages. Free movie player included!

PACo Producer

CoSA 7 Add sound and accelerate playback of your animations or videos while eliminating memory constraints. **PACo Producer**, the next generation of QuickPICS™, creates movies from any program that outputs PICS, PICT or QuickTime™ files. **PACo** movies play on all Macs, PCs running Windows and Unix workstations.



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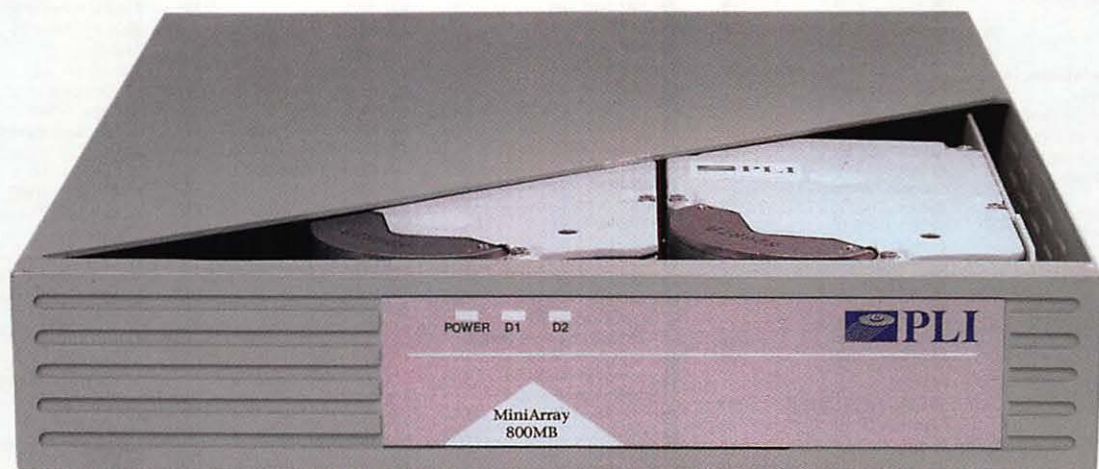
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Questions and Tips from Macworld Readers

BY LON POOLE

THE TIP ABOUT FIXING BROKEN supports for SIMMs with photoreactive glue made for stained glass (*Quick Tips*, March 1992) rang a bell with Stuart David of New York. He accidentally snapped $\frac{1}{16}$ inch of plastic off a support and was faced with replacing the logic board for \$700. His low-tech solution: shoving four trapezoidal wedges cut from shirt cardboard between the wiggly SIMM and its sturdy neighbors (see "Makeshift Supports"). He made the top of each wedge slightly wider than the distance between the SIMMs, and the bottom of each wedge slightly narrower than that distance. The height of the wedge is about an inch, depending on the innards of the particular Mac model. While there's no warranty attached to this kind of repair, David's is still holding strong after two years. I have also heard of people stretching a rubber band around the front of a loose SIMM and the back of a secure SIMM behind it. (This method won't work for the last SIMM because there is no SIMM behind it.) If you'd rather not jury-rig a repair, you can have a broken SIMM socket replaced for \$100 to \$150 by an independent service technician who does board-level repairs on Macs. Look for computer repair shops in the yellow pages of any large city. Few Apple-authorized service centers repair circuit boards because Apple instructs them to always swap the whole board and return the defective board to Apple's repair center in Cupertino. As you can see, this approach can cost more money for no good reason.

LaserWriter Toner Refills

Five months ago I asked readers to send in their experiences with toner refills for laser printers, and promised to summarize the results. I expected to hear mostly from people who had trouble, figuring people wouldn't take the time to write about good news. Jo Anne Edwards of Johnson, Vermont, wrote about troubles with refilled cartridges purchased from Toner Etc. of Portsmouth, New Hampshire, for her office's Hewlett-Packard LaserJet Se-

ries II, which prints about 25,000 pages a year. Seals broke off inside cartridges instead of sliding out, cartridges ran out of toner quickly, and new cartridges arrived empty. In the same letter, Edwards reported excellent results with refilled cartridges purchased elsewhere for her LaserWriter IINT at home. Several other readers reported no problems and as good or better quality with refilled toner cartridges from various sources. But nobody else wrote about problems, leading me to believe refilled toner cartridges must be pretty reliable.

Mail-Order Mac

Q. I am planning to buy a Mac IIsi by mail order. I have been told that Apple offers no warranty for mail-order purchases. Is there any way I can check on the reputation and dependability of the various mail-order companies?

Lynn Noyes

Nevada City, California

A. Authorized Apple dealers are supposed to provide warranty service on any Apple equipment no matter who sold the equipment to the consumer. Nevertheless, individual dealers may refuse service unless you bought from them. If this happens to you, try another dealer and let Apple know about the one who refused you.

No dealer will handle warranty repairs on equipment with missing or obliterated serial numbers because Apple won't reimburse a dealer for parts and labor without serial numbers. Some equipment bought by mail lacks valid serial numbers to prevent the equipment from being traced back to the authorized dealer who originally ordered it from Apple. Mail-order companies buy overstocked Apple hardware from authorized dealers who, scheming for a better discount from Apple, ordered more than they can possibly

sell to consumers. Reselling to mail-order companies violates a dealer's agreement with Apple and could result in Apple revoking the dealer's authorization to sell Apple products. Although the supply of mail-order Macs relies on shady dealings, there's nothing illegal about your buying Apple hardware by mail. That's why it's called the gray market and not the black market. Apple will not void or reduce your warranty simply because you didn't buy from an authorized dealer, but if your equipment has no serial numbers, you essentially have no warranty. The moral: Make sure you get a money-back guarantee before buying by mail, and when your equipment arrives, check for complete and unaltered serial numbers.

To get the lowdown on three dozen mail-order companies and learn how you can protect yourself when buying by mail, read *Conspicuous Consumer*, *Macworld*, November 1991.

Font Confusion

Q. I have been trying to sort out all this font stuff. I know how each of my fonts looks on my Mac IIsi screen and my Personal LaserWriter IINT printer, but I'm still a bit confused. My three types of font icons seem to correspond to more than three types of fonts. What are the differences between TrueType printer fonts with their screen fonts, PostScript printer fonts with their screen fonts, and screen fonts that don't seem to have printer fonts? Why do some screen fonts without printer fonts print smoothly (New Century Schoolbook) and others print jagged (London)? Are TrueType screen fonts necessary? I read *Desktop Publisher's Survival Kit*. It's a great book, but I couldn't find the answers to those questions. Can you suggest another book?

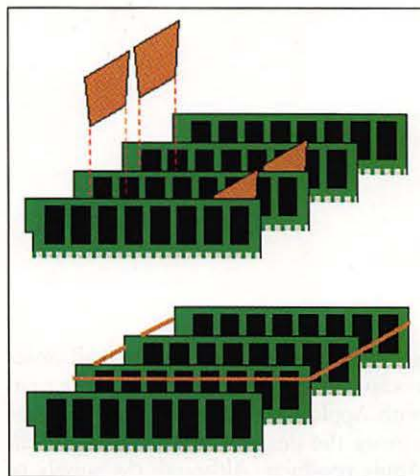
Phil C. Hagemann

North Babylon, New York

continues



*Buying Macs by
mail,
understanding
fonts,
seeing all in
Spectre,
and more*



Makeshift Supports If you break the support for a SIMM, try wedging trapezoidal pieces of shirt cardboard around it (top) or strapping it in place with a rubber band (bottom).

A. Your Macintosh can display and print text using three types of fonts: fixed-size, TrueType, and PostScript. No one of them is strictly for printing or screen display. A fixed-size font contains exact pictures of every letter, digit, and symbol for one size of the font. Fixed-size fonts are often called bitmap fonts because each picture precisely maps the dots, or bits, to be displayed or printed for one character. Each fixed-size font looks great in one size only. If you need text in a size for which no fixed-size font is installed, the system must scale the closest installed size up or down to the size you want. The results are usually jagged.

TrueType fonts define characters not with fixed bitmaps but with variable-size outlines. The Macintosh system software smoothly scales TrueType outlines to any size on screen or any printer and then fills in the outline with dots at the screen or printer resolution. Because the system software makes a custom bitmap on the fly for a particular text size and output device, results are always smooth.

Like TrueType fonts, PostScript fonts use outlines to define character shapes, and consequently they look smooth at any size. PostScript fonts were originally designed for printing, and the system software used a set of matching fixed-size fonts installed in the System file for screen display. Most LaserWriters and many other output devices have PostScript fonts built in. Other PostScript fonts can be put in the System Folder (or the Extensions folder in System 7), and the system software transfers (downloads) them to the printer as needed. Today the more common PostScript fonts have TrueType equivalents for screen display and for printing on devices that don't use

the PostScript page-description language. Alternatively, your Macintosh can display PostScript fonts on screen after you install Adobe Type Manager (ATM) and the PostScript fonts in your System Folder. (ATM can't use fonts built into your printer.) In the meantime, ATM is available in the U.S. and Canada for a \$7.50 shipping fee (call 800/521-1976, ext. 4400). The ATM special offer includes four versions of Adobe Garamond and a coupon offering the four basic LaserWriter fonts—Courier, Helvetica, Times, and Symbol—for \$49. The Adobe Plus Pack, which includes the other seven standard LaserWriter fonts—Avant Garde, Bookman, Helvetica Narrow, New Century Schoolbook, Palatino, Zapf Chancery, and Zapf Dingbats—lists for \$198.

Even with TrueType fonts installed, you may want to keep corresponding fixed-size fonts (all sizes) installed, for several reasons. TrueType and fixed-size fonts have slightly different letterspacing that can change line breaks in old documents and can reduce the amount of text that fits in a small space on spreadsheets, database layouts, and HyperCard screens. Furthermore, fixed-size fonts look a little better on screen and display a bit faster on slow Macs than do programmed TrueType fonts.

You may wonder how the Mac decides when to use fixed-size, TrueType, and PostScript fonts when more than one is installed. On screen, the Mac prefers an installed size of a fixed-size font, next a TrueType font, and then an ATM PostScript font. On a PostScript printer, the Mac prefers a PostScript font from the printer's ROM, RAM, or hard drive (if any); next a PostScript font downloaded (copied) from the Mac's System Folder (or Extensions folder); then a TrueType font; and finally a fixed-size font. On other printers, the Mac prefers a TrueType font, next an ATM PostScript font, and then a fixed-size font.

The definitive book on Macintosh fonts is *The Macintosh Font Book, 2nd Ed.* (Peachpit Press, 1991), by *Macworld* contributing editor Erfert Fenton.

VM Disk Hog

Q. My Mac IIci has 5MB of RAM, but I need 7MB of memory to use Mathematica Enhanced 2.0. I used System 7's Memory control panel to set virtual memory to 7MB, expecting to surrender 2MB of hard drive space. When I happened to restart my Mac with System 6.0.7, the VM Storage file became visible, and I noticed it took 7MB! With that much hard drive space used for virtual memory, I should have 12MB of total memory when operating under System 7,

but I only have 7MB. Is this a bug or is there an explanation?

*Joff Derluyn
Roeselare, Belgium*

A. Before answering your question, I must lecture you about the best uses of virtual memory. Opening one big program that needs more memory than the amount of RAM installed, as you are doing, usually degrades system performance markedly. Virtual memory is best used for keeping multiple programs open, none of which requires more than the amount of RAM installed.

For performance reasons, System 7's virtual memory does indeed use a disk file the size of your total memory setting—in your case, 7MB. Two virtual memory alternatives from Connectix (800/950-5880 or 415/571-5100), Compact Virtual 3.0 and Virtual 3.0, have an option that lets you reduce the virtual memory file's size by the amount of installed RAM. Performance declines, but Connectix claims that with this disk-space-saving option turned on, its virtual memory is about the same speed as System 7's disk hog. With the disk-space-saving option turned off, Connectix claims, its virtual memory is faster than System 7's. Compact Virtual 3.0 brings virtual memory to a Mac Plus, SE, or Classic retrofitted with an accelerator board that has a 68030 microprocessor. Accelerated or not, those Macs can't use System 7's virtual memory because their ROMs lack the necessary information. Connectix found a way around that limitation and began distributing Compact Virtual 3.0 in March through companies that make accelerator boards. Virtual 3.0, which will bring the disk-space-saving option and faster virtual memory performance to Macs that can use System 7's virtual memory, was still under development at this writing.

Trackballs and Eyeballs

TIP It's possible that the pretty shooter marble I found at a local children's store (Such a Business, in Emeryville, California) works better than the gray trackball Apple provided with my PowerBook 100. It adheres well to the inner rubber rollers and certainly has a more solid feel. Take your Mac to a toy store and check the fit!

Don't let that naughty disappearing ("submarining") pointer make you go blind. Try installing the 6K system extension called Eyeballs in your Extensions folder (or System Folder). The two little eyes it adds to the menu bar are more than amusing. They really help by always staring at the pointer, even when you can't see

continues

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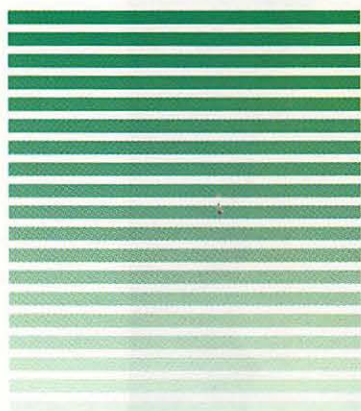


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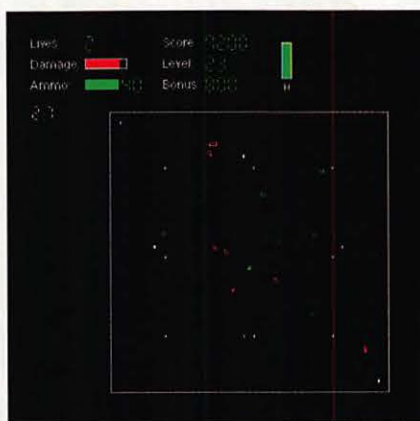


Tint Finder



When working in Adobe Illustrator you may need a lighter shade of a process color for decorative accents, tint boxes that run behind type, and so on, but you may not be sure how much lighter to go. You can try to find the desired tint by guessing at different combinations of cyan, magenta, and yellow. Instead, Robert Engman of Northampton, Massachusetts, suggests you have Illustrator create a range of tints like the range shown above. Then you pick a tint you like from the range and have Illustrator tell you its color mix. Here's what you do.

1. Begin by drawing a straight line and painting it the process color for which you want to find a tint—for example, 89 percent cyan, 15 percent magenta, and 65 percent yellow (the top line above). When you use the Style command to set the process color, be sure to set the line weight heavy enough (5 points) so you will be able to easily distinguish the variation between tints.
2. Copy the line, drag the copy a couple of inches below the original, and change its color to white.
3. Create a blend between the two straight lines. The number of steps depends on how subtle you want the difference between tint steps to be. For example, 19 steps gives you a 5 percent difference between steps.
4. Select the blended lines and preview the selection. Determine which tint you like, switch an artwork view, select the line whose tint you liked, and use the Style command to ascertain the line's color mix.



Sky View To view the Spectre battle from above, just type the secret word.

it. I look at them innumerable times, wagging the trackball when desperately sniffing out a truly elusive pointer.

*Jay Sheckley
Berkeley, California*

You can get Eyeballs, by Ben Haller, free from a user group or an online information service.—L.P.

Spectre Omniscience

TIP I've found a great new tip for playing Velocity Development's Spectre. The manual tells clearly how you can use the tab key to rotate through the three different battle views. But there is a fourth, undocumented view that can make winning at Spectre a whole lot easier. To see this new view, type *God* at any point during game play, and the screen switches to an overhead view. From this vantage you can see all the other players (enemies), the blocks, and even everyone's shots (see "Sky View"). To switch back, just press the tab key. Have fun with it. It makes it a lot easier to wipe up (especially if you're playing on a network).

*Cliff McCollum
Edmonton, Alberta, Canada*

One LaserWriter, One Mac

TIP Every manual, bible, encyclopedia, and big book for the Mac gives the impression that you must use network connectors and cables to connect a LaserWriter II or Personal LaserWriter NT to a Mac. This is not true. You only have to buy all that stuff if you're hooking more than one Mac to the printer—in other words, setting up a network. Those of us whose network consists of one Mac and one LaserWriter can use a \$10 serial or null modem cable, such as the one used to connect an ImageWriter II to the Mac. Network connectors cost \$20 to \$50 each and you would have to buy two.

*Howard Adkins
Gilbert, Arizona*

No More Alias Trouble

TIP In *Insights* (February 1992) you wrote about some strategies for quickly removing the word *alias* from the end of alias files created by System 7's Finder. I find it more convenient never to have the word appended to the file name at all, since I inevitably ended up removing it.

I used ResEdit on a copy of the Finder to edit the first string (text) in the Finder's STR# resource number 20500. This is the string the Finder appends to the original file name to make up the alias name. I changed the string to one blank space, rather than making it completely empty, so the names of original files and their aliases would be different.

*Nicholas P. Wilde
Boulder, Colorado*

Copy Multiple Icon Names

TIP With System 7, you can select and copy a list of icon names from the desktop, a folder window, or disk window (shift-click the icons or drag across them in any view, then use the Copy command). The maximum length the list can be is 256 characters. After copying, use the Paste command in any program that lets you paste multiple lines of text.

*Eric Apgar
Saratoga, California*

PowerBook Printer

TIP The PowerBook 170 has a big undocumented capability—portable printing. Because the PowerBook 170 has a built-in fax modem and fax machines are so common, you need only connect the fax modem to a phone line, dial up a nearby fax machine (on the same desk perhaps), and "print" any document on the fax machine. If you travel light, you can't beat it.

*Scott Tilden
North Brunswick, New Jersey*

You can have a fax modem installed in a PowerBook 100 or 140 as well.—L.P. **m**

We pay from \$25 to \$100 for tips published here. Send questions or tips on how to use Mac computers, peripherals, or software (by mail or electronically) to *Quick Tips*, Lon Poole, at the addresses listed in *How to Contact Macworld* at the front of the magazine (include your address and phone number). All published submissions become the property of *Macworld*. Due to the high volume of mail received, we're unable to provide personal responses.

LON POOLE answers readers' questions and selects their tips for this monthly column. His two most recent books are *Amazing Mac Facts* (Microsoft Press, 1991), a collection of the best published tips; and *Macworld Guide to System 7* (IDG Books Worldwide, 1991).

NICE

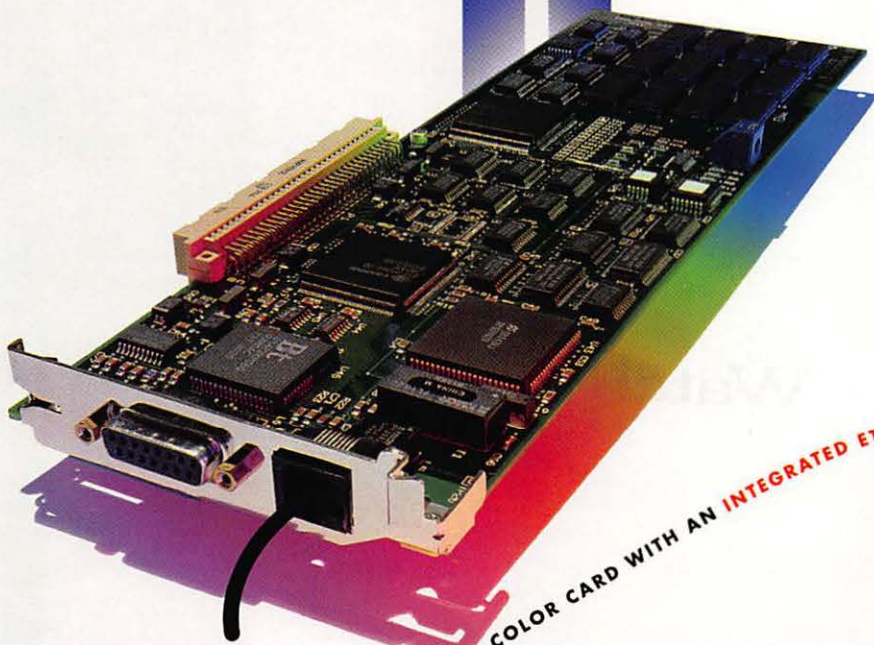


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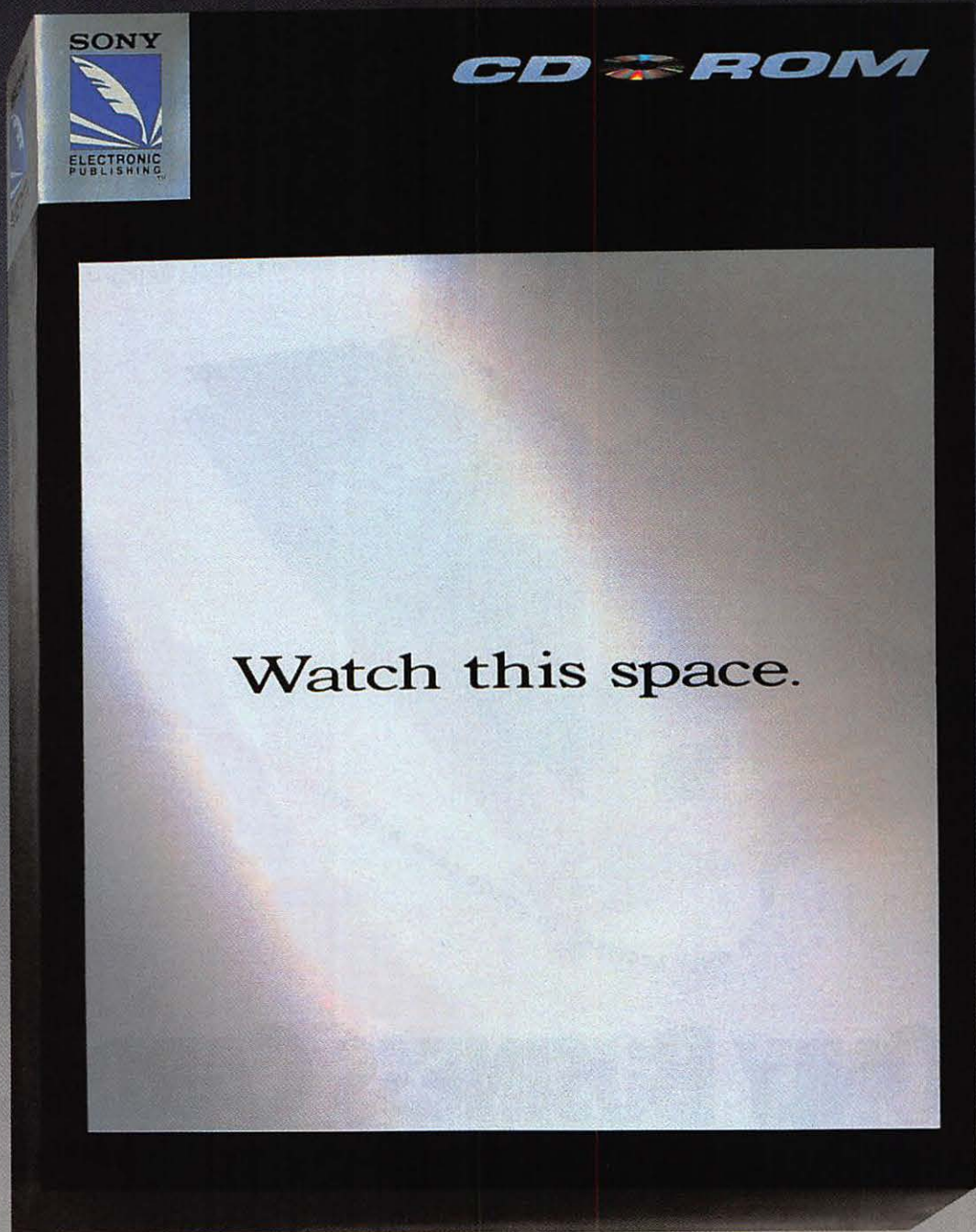


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Spreadsheet Techniques

BY JIM HEID

BUSINESS WITHOUT SPREADSHEETS? It's easier to imagine soup without sandwiches or Abbott without Costello. The spreadsheet program has been around for only a little more than a decade, yet it's hard to imagine doing business without it. Creating budgets and business plans, estimating profit and loss, forecasting sales, experimenting with mortgage options, analyzing statistics—spreadsheets have tamed these and myriad other calculation-intensive chores.

The basic concepts are simple. A spreadsheet consists of horizontal lines, called *rows*, and vertical lines, called *columns*, that intersect to form a grid of boxes called *cells*. Rows are labeled by number, and columns by letter, giving each cell its own *address* (such as A2 or B3). You move from cell to cell using the mouse or the keyboard's arrow keys. You type numbers (or sometimes, text labels) into the cells and then create *formulas* that describe the mathematical relationship between the numbers and calculate the results (see "Spreadsheet Basics Illustrated"). For example, a formula you type in cell A3 could add the contents of cells A1 and A2, showing the total in A3. You can then ask "what-if" questions—that is, you can plug different numbers into the formula to see how they impact the end result. What if we budget \$1500 per month for expenses instead of \$1700? What if our mortgage interest rate is 9 percent instead of 11? Each time you change a number on which a calculation is based, the spreadsheet program automatically *recalculates* the spreadsheet to reflect that change. In doing so, the spreadsheet becomes a flight simulator for math—a risk-free way to learn the best approach to a specific problem and set of conditions.

And today's spreadsheet programs do so much more than crunch numbers. They can create colorful graphs and charts, support Mac fonts and graphics, and (under System 7) perform data exchange and linking between programs.

This month I show how to take advantage of these and other spreadsheet features using the Big Three: Microsoft Excel 3.0 and its two new competitors, Lotus 1-2-3 for Macintosh and Claris Re-

solve. Much of the information here also applies to the spreadsheet modules in integrated packages such as Microsoft Works and ClarisWorks.

Feel Free to Point

BECAUSE FORMULAS FORM THE BACKBONE of a spreadsheet, let's start with some quick and easy ways to create them. One of the most tedious parts of building a formula is specifying cell addresses. Add B4 to B2 and divide by G6—it's enough to make you feel like a bingo player. The *cell pointing* feature all spreadsheets provide simplifies creating formulas by eliminating the need to type addresses.

How to: All After typing the equal or plus sign that denotes the beginning of a formula, point to the first cell to be included in the formula and then click. The program enters that cell's address in the formula. You can then type a math operator (or choose a function) and click on another cell to add it to the formula. If the formula needs to refer to a range of cells, drag across the cells to automatically create the range reference.

Name That Cell

UNLIKE THE SPREADSHEETS IN MICROSOFT Works and ClarisWorks, the Big Three allow you to assign descriptive names to cells and cell ranges. You can take advantage of this to create more descriptive formulas. For example, say you're creating a spreadsheet that calculates a car's gas mileage. If you name the cells that hold the miles-driven and gallons-used information, you can create a descriptive formula such as `=MilesDriven/GallonsUsed`. That says a great deal more about the formula's workings than `=A5/B5` does, and you'll appreciate the clarity if you have to modify the spreadsheet six months after creating it.

How to: Excel Select the cell to be named and then choose Define Name from the Formula menu. Type a name and click on OK. (If the cell to the left of the active cell contains text, Excel proposes that text as the cell's name; if that's what you want, simply click on

OK.) To use the name in a formula, choose Paste Names from the Formula menu and then select the desired name.

How to: 1-2-3 Select the cell to be named and then choose Create from the Range pop-up menu, located in the console (or choose Create from the Name submenu in the Range menu). Type a name for the cell (spaces are permitted) and click on OK. To use a name in a formula, select the name from the Range pop-up. You can tell 1-2-3 to use the text in adjacent cells by using the Name submenu's Label Create command.

How to: Resolve Select the cell to be named and then choose Name Ranges from the Format menu. To use a name in a formula, choose Paste Function from the Calculate menu, then choose Names from the Function Type pop-up, and then (whew!) double-click on the desired name.

How to: All You can also name an entire range of cells. Select the cells by dragging across them, and then use the appropriate naming command. Once you've named a Range, you can use the spreadsheet's navigation features (such as 1-2-3's Range pop-up or Excel's Goto command) to quickly jump to that range. This spares you from tedious scrolling when you're working with a large spreadsheet. You can also use a range name in a formula for clarity; for example, the 1-2-3 formula `@SUM(QuarterlySales)` is more descriptive than `@SUM(B1..B6)`. This method also makes it easier to create and modify graphs, since each of a graph's components (bars, lines, pie wedges, and so on) can refer to a named range instead of a series of cell addresses.

Avoid putting a space in a name. (Excel won't let you do it.) To simulate a space, use an underscore character, as in `Quarterly_Sales`. Press shift-minus sign (-) to get the underscore character.

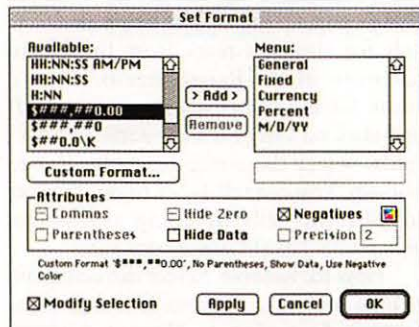
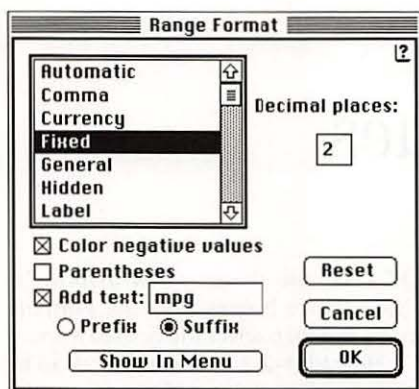
Format Cells Appropriately

SPREADSHEET PROGRAMS CALCULATE numeric values very accurately—using up to 19 decimal places. That's comforting, but it's often more precision than you really need. Dollars-

continues



*A hands-on
tour of
spreadsheet
basics*



Numbering Your Options Spreadsheets give you complete control over how numbers and date values appear in cells. In Lotus 1-2-3 (top), you can even specify that text appear before or after a value. If you use a specific formatting scheme often, click on the Show In Menu button; thereafter, you can choose the scheme from the Range menu instead of using the Format dialog box. Claris Resolve (bottom) also lets you add often-used formatting schemes to its menus. Clicking on the small colored box next to the Negatives check box displays a pop-up palette that lets you choose a color for negative numbers. To have negative values appear in color in 1-2-3, choose the Color Negative Values option.

and-cents values, for example, require two decimal places. The answer: cell formatting. Telling your spreadsheet to format currency values appropriately gives you not only an appropriate number of decimal points, but also a dollar sign (or the currency symbol of your choice). You can specify other types of numeric formats for noncurrency values (see "Numbering Your Options").

Cell-formatting features go beyond numbers to also include text and date values. You can specify whether text appears aligned against the left or right edge of a cell or centered within it. You can choose a variety of date formats that include the day of the week and various date and month abbreviation schemes. Most programs also let you specify that negative numbers appear in a color, bringing new meaning to the phrase "in the red."

All spreadsheets allow you to apply the Mac's variety of fonts, sizes, and type styles to cells. For instance, you can format headings or key cells in bold. Want to

fit more data on a page? Decrease the type size of every cell or use a narrower font. (If you use a laser printer, you can accomplish the same result by specifying a reduction percentage in the Page Setup dialog box. This approach yields more cells per printed page without forcing you to squint at tiny cells on the screen.)

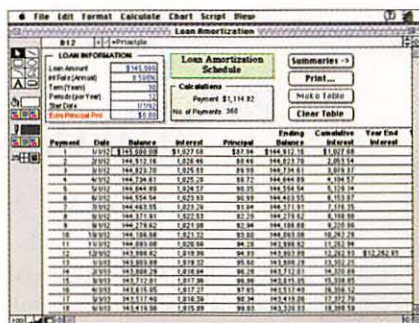
How to: Excel To change a cell's number or date format, choose Number from the Format menu and then double-click on the desired format. To change a cell's alignment, click on the appropriate alignment button in Excel's tool bar. If you want lengthy text labels to wrap around to subsequent lines, choose Alignment from the Format menu and then check the Wrap Text box. To change a cell's font or size, use the Format menu's Font command. You can also summon bold or italic by clicking on the appropriate tool-bar icon. To reuse a set of formatting options, create a *style*: format a cell as desired, type a brief, descriptive name in the style portion of the tool bar, and press return. To apply that style to another cell, select that cell (or a range of cells) and then choose the style's name from the tool bar's pop-up menu.

How to: 1-2-3 To change a cell's number or date format, choose Format from the Range menu to display the Range Format dialog box. Select the desired format and then click on OK. You can also use the Range Format dialog box to add often-used formats to the Range menu. To change a cell's font or size, choose Font from the Style menu. If you frequently use a specific font, size, and style combination, click on the Show In Menu button before closing the Style Font dialog box. You can also use the Style floating palette to summon the plain, italic, or bold styles.

How to: Resolve To change a cell's number or date format, choose the desired format from the Numeric submenu (in the Format menu). You can customize the list of formats in the submenu by choosing Set Format and create your own display format by choosing Custom Format. Use the Format menu's Font, Size, and Style submenus to change a cell's appearance or text alignment.

How to: All If you've changed a cell to appear in bold or in a larger type size, the cell's contents may not fit within the column's width. In Excel and 1-2-3, simply double-click on the cell's right-column boundary, and the program resizes the column to accommodate its widest cell. In Resolve, you must resize the column manually by dragging its boundary.

All three programs also provide a variety of keyboard shortcuts for changing cell alignment and type style.



Borders and Shading Appropriate use of cell borders and shading can make a spreadsheet easier to read and use. In this Claris Resolve spreadsheet, top and bottom cell borders separate each line of the loan-amortization table, lessening the chance that readers' eyes will skip to an adjacent row as they scan from left to right. Color shading helps highlight key areas of the spreadsheet.

Citizen Spreadsheet

BEFORE THE MAC, SPREADSHEETS WERE dull tables of numbers that only a bean counter could find attractive. But not only do Mac spreadsheets provide access to the Mac's typographic talents, they also sport some desktop publishing features. In fact, if you need to create fill-in-the-blank forms such as invoices and insurance applications, a spreadsheet might be a better tool than a publishing program. The spreadsheet's row-and-column grid ensures that a form's elements are visually aligned with each other. You can configure cell borders to act as lines and boxes, and you can shade cells, rows, or columns to set them apart. Best of all, you can use the spreadsheet program itself to fill out and calculate values on the form.

Even if you don't have publishing aspirations, you can use borders and shading to create more readable spreadsheets. If a spreadsheet contains long rows, add a top and bottom border to the cells in each row. This creates a line (in graphic arts parlance, a *rule*) that visually separates each row, lessening the chance that readers' eyes will stray to adjacent rows as they scan across the spreadsheet. If your spreadsheet contains dozens of rows, consider adding a blank row after every five or ten rows to make the spreadsheet less dense on the screen. If you'll be printing the spreadsheet, consider applying a light shading to every other row. "Borders and Shading" illustrates these techniques.

Spreadsheets created with the Big Three can even contain images created in other programs. You can take advantage of this feature to add a company logo or scanned image to forms or spreadsheets.

How to: Excel To add a border to all four edges of a cell, choose Border from the Format menu and then select the Out-

[illegible]

PREREGISTER/SAVINGS PREREGISTER/SAVINGS PREREGISTER/SAVINGS PREREGISTER/SAVINGS PREREGISTER/SAVINGS

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Downtown Shuttle Stops:

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Shuttle Schedule:

August 4 - August 6, 1992

9am-11am Downtown Morning Shuttle

9am-6pm Bayside Expo Center & World Trade Center Express

5pm-7pm Downtown Evening Shuttle

August 7, 1992

9am-11am Downtown Morning Shuttle

9am-3pm Bayside Expo Center & World Trade Center Express

2pm-4pm Downtown Evening Shuttle

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If you miss the preregistration deadline on June 26, you can still register before the start of the show to avoid long lines! On-site Early Bird Registration is from 11 a.m. - 3 p.m. on August 3, at the full registration rates of \$90 (cash at the door) for all Conference Sessions* and Exhibits, and \$30 for Exhibits-only admission (cash at the door).

More Information

To listen to prerecorded information about MACWORLD Expo/Boston 1992, call the MACWORLD Expo Information Hotline at 617-361-3941. (24 hours per day, seven days a week.) We'll see you in Boston!

Show Hours

Exhibition:

Aug. 4: 10 a.m. - 6 p.m.

Aug. 5: 10 a.m. - 6 p.m.

Aug. 6: 10 a.m. - 6 p.m.

Aug. 7: 10 a.m. - 3 p.m.

Conference:

10 a.m. - 6 p.m.

10 a.m. - 6 p.m.

10 a.m. - 3 p.m.

Hotels

57 Park Plaza (B)
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Boston Park Plaza Hotel
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Hilton at Dedham Place
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Holiday Inn Randolph (H)
961-1000; \$87/\$95

Howard Johnson/Southeast (H)
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Lafayette Hotel (B)
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Meridien (B)
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Midtown Hotel (C)
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Omni Parker House (B)
227-8600; \$145/\$165

Ritz Carlton (B/C)
536-5700; \$195/\$195

Royal Sonesta Cambridge
491-3600; \$140/\$140

Sheraton Boston (C)
236-2000; \$142/\$142

Sheraton Tara Braintree (H)
848-0600; \$99/\$99

Tremont House (B)
426-1400; \$105/\$120

Westin Copley (C)
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All phone numbers are in the 617 area code.

Rooms are priced for single and double occupancy.

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(check with hotel directly for specifics).

*All conference sessions are on a first-come, first-served basis with no guaranteed seating.

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include your telephone number and country code. We will Federal Express your badge directly to you.

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- 03. ☐ Business
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- 07. ☐ Engineering
- 08. ☐ Government
- 09. ☐ Health services
- 10. ☐ Higher Education
- 11. ☐ Information services
- 12. ☐ K-12 Education
- 13. ☐ Legal services
- 14. ☐ Manufacturer (computer industry)

15. ☐ Manufacturer (non-computer)

16. ☐ Other (specify) _____

Your title

- 17. ☐ CEO/President/VP
- 18. ☐ DP/MIS Manager
- 19. ☐ Manager/Department head
- 20. ☐ Network Manager
- 21. ☐ Programmer/analyst
- 22. ☐ Engineer/R & D
- 23. ☐ Consultant
- 24. ☐ Marketing/sales
- 25. ☐ Educator
- 26. ☐ Art director/graphics
- 27. ☐ Editor/writer

28. ☐ R & D

29. ☐ Student

30. ☐ Other (specify) _____

Size of your organization (number of employees national and international)

- 31. ☐ Under 50
- 32. ☐ 50-99
- 33. ☐ 100-499
- 34. ☐ 500-999
- 35. ☐ 1,000-5,000
- 36. ☐ Over 5,000

Which personal computer(s) do you own/use?

- 37. ☐ Macintosh (128K, 512K(E))
- 38. ☐ Macintosh Plus

39. ☐ Macintosh Classic/Classic II

40. ☐ Macintosh LC

41. ☐ Macintosh SE/SE 30

42. ☐ Macintosh II/Ix

43. ☐ Macintosh II si

44. ☐ Macintosh II cx/ci

45. ☐ Macintosh II fx

46. ☐ Macintosh Quadra Series

47. ☐ Macintosh Portable/

Powerbook Series

48. ☐ Apple II Series

49. ☐ IBM PC (or compatible)

50. ☐ None

51. ☐ Other (specify) _____

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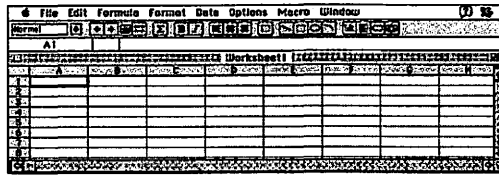
Spreadsheet Basics Illustrated

When you first open a spreadsheet program, such as Microsoft Excel (shown here), you see a worksheet consisting of rows and columns that intersect to form a grid pattern of cells.

The *active cell*—the one your typing or formatting affects—is indicated by a bold border. When you type a text label or formula, it appears along with the active cell's address in the *formula bar*.

Creating a formula involves first typing an equal sign, and then pointing to cells and typing math operators such as the division symbol (/) shown below at left. This formula calculates a car's gas mileage by dividing the contents of cell B1 by the contents of cell B2. When creating or editing a formula, you can undo your typing by clicking on the X icon in the formula bar, or enter your changes by clicking on the check-mark icon. When you enter a formula, the spreadsheet calculates its result (below, middle).

All spreadsheets provide a battery of *functions*, which are preprogrammed formulas that accept *arguments* and then return a result. For example, the AVERAGE function accepts as its arguments a list of numbers or, as shown below at right, a range of cell addresses, and then returns the average of those numbers or cell contents.



	A	B
1	Miles Driven	350
2	Gallons Used	9.5
3		
4	Gas Mileage	=B1/B2
5		
6		

	A	B
1	Miles Driven	350
2	Gallons Used	9.5
3		
4	Gas Mileage	36.8421053
5		
6		

	A	B
1	Week 1	31.3434
2	Week 2	26.455
3	Week 3	23.456
4	Week 4	34.453
5		
6	Average	=AVERAGE(E1:E4)

line option. To border all four edges of each of the cells within a range, select the Left, Right, Top, and Bottom options. (If you select the Outline option for a range, only the outer edges of the range will have borders.) To add the border to only certain edges such as the top and bottom, select only those options. You can use the Style area of the Border dialog box to choose from eight line widths and patterns. To shade a cell, check the Border dialog box's Shade box. You can change the pattern Excel applies to shaded cells using the Format menu's Patterns command. You can reuse a border and shading arrangement elsewhere by selecting a bordered or shaded cell and then creating a style as described earlier.

To include a graphic in a spreadsheet, open the graphic in the program, select it, and choose Copy. Next, switch to or start Excel, select the cell where you want the graphic to appear, and paste. You can resize the graphic by dragging its handles; press the shift key while dragging a corner handle to resize the graphic and maintain its original proportions.

How to: 1-2-3 To enclose a cell within a border, choose Border from the Style menu and then choose the Outside option. (You can also choose border options from the Style floating palette.) To border all edges of the cells within a

ner, and Vertical Inner options. To shade a cell, choose one of the light-shaded patterns from the Style palette's pattern pop-up menu. To apply an existing border or shading arrangement to other cells, select the bordered or shaded cells and choose Copy. Next, select the cells you want to reformat and choose Paste Special. In the dialog box that appears, select the Styles and Formats option. To import a graphic located on the Mac's Clipboard, select the Draw palette's picture tool (the camera), and then click on the area of the worksheet where you want the picture to appear. You can resize the picture by dragging its corner handles; press shift to avoid altering its proportions. To import the picture at a specific size, select the picture tool and then drag across the worksheet to create a box of the desired size. To restore a picture's original size, simply double-click on it.

How to: Resolve To border a cell, choose Cell Borders from the Format menu and then select the Outline option. To border all cell edges within a range, select the Left, Right, Top, and Bottom options. To shade a cell, select a light-color pattern from the Fill pop-up menu (next to the paint bucket). To import a graphic, paste it from the Clipboard. Drag the graphic's corner handles to resize it. Be careful not to change the graphic's proportions, however; unlike 1-2-3 and

Excel, Resolve doesn't let you maintain proportions by pressing the shift key.

Exchanging Data

EVEN WITH THEIR FANCY LAYOUT FEATURES, spreadsheet programs aren't word processors or page-layout programs. If you want to include spreadsheet data or a graph in a lengthy document, you need to *export* it. Which method you choose depends on how you want the cells to appear in the final document, and on whether you want to be able to quickly update a table or graph if its underlying spreadsheet changes.

How to: Excel To copy the data in a range of spreadsheet cells into another program, select the cells and choose Copy from the Edit menu. Next, start or switch to the second program and choose Paste. If you paste the data into Microsoft Word, it appears, with formatting intact, as a table whose cells you can edit and format individually. If you want to create a link with the original spreadsheet, choose Word's Paste Special command. In the Paste Special dialog box, select the Excel option and then click on the Paste button. Thereafter, you can edit the spreadsheet in Excel by double-clicking on the cells you pasted. When you return to Word, you'll see that it has automatically updated the document to reflect your edits.

Word and Excel mesh beautifully, but if you paste some copied cells into a different program, any text or border formatting you did in Excel is lost. If you want to retain borders, shading, and other formats, copy the spreadsheet cells as a picture. In Excel, select the cells and then press the shift key while opening the Edit menu. Notice the Copy command now reads Copy Picture. Choose Copy Picture, and then select the As Shown When Printed option. Now switch into the second program and paste. You can also use this technique to move a chart into another program.

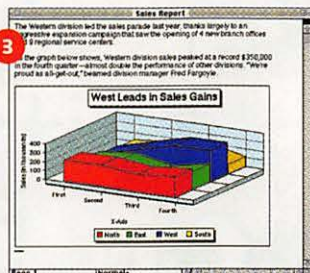
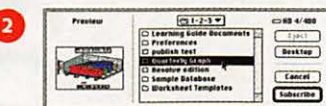
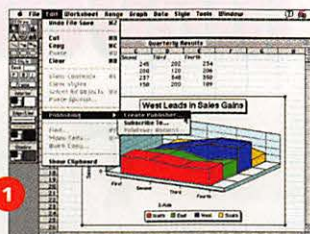
How to: 1-2-3 and Resolve To copy a range of spreadsheet cells into another program, select the cells, choose Copy, start or switch to the second program, and choose Paste. Neither 1-2-3 nor Resolve can copy cells as a picture, so all formatting is lost when you paste copied cells into another program.

How to: All All three programs support System 7's publish and subscribe commands. If you use a word processor or publishing program that also supports publish and subscribe, you can use its Subscribe To command to include published cells or graphs in your documents, as shown in "Publishing and Subscribing." The benefit of exchanging data through publish and subscribe is that you can

Publishing and Subscribing

If you use Apple's System 7 software, you can create links between a spreadsheet or chart and a document created in a word processor or any other program that supports System 7's publish and subscribe features. Here, a Lotus 1-2-3 graph is included in a Microsoft Word 5.0 document.

1. Select the chart and choose Create Publisher from the Edit menu's Publishing submenu. When the Create Publisher dialog box appears, type a name for the *edition file* (the graph) and then press return.
2. In Microsoft Word, choose Subscribe To from the Edit menu. The Mac automatically selects the edition file you just created and shows a preview of it.
3. The graph appears in the Word document.
4. To change the way the graph is updated when it or its underlying data change, use Word's Subscriber Options dialog box (top) or 1-2-3's Publisher Options dialog box (bottom). Both let you specify when and how Word should receive an updated version of the graph. Finally, a graphing tip: When creating a heading for a graph, summarize the key point or trend that the graph depicts. For example, the graph in this illustration is titled "West Leads in Sales Gains." That says more about the graph than would, say, "Year-End Sales Results."



quickly update the word processed or desktop published document if the original spreadsheet changes.

One final point about graphs and the Clipboard: The graphs that spreadsheet programs create are actually object-oriented graphics that you can modify using programs such as Adobe Illustrator or Aldus FreeHand. Paste a graph into a draw program, and you can embellish it using the program's drawing tools.

Next Steps

WHEN YOU'VE MASTERED THE TECHNIQUES covered here, you may want to explore the advanced features the Big Three provide. All three provide *macro*, or *scripting*, languages that let you automate repetitive tasks and create custom menus and dialog boxes. You can write a macro yourself by typing it, or you can tell the program to record a macro based on your actions. You can create on-screen buttons that execute macros when clicked on.

If you create huge spreadsheets, investigate your program's *linking* features. To link one spreadsheet to another, you cre-

ate a formula that refers to one or more cells in another spreadsheet. By creating and linking small spreadsheets, you can keep your project more manageable.

If you haven't purchased a spreadsheet yet, see "Spreadsheets That Count," in this issue, for some recommendations and critical comparisons. For insights on designing spreadsheets, read *The Elements of Spreadsheet Style*, by John M. Nevison (Brady, 1987). Nevison shows how to create spreadsheets that are easy to read and modify, that clearly state their objectives and assumptions, and most important, that yield accurate results. Once you master Nevison's rules and the ins and outs of your spreadsheet program, you'll spend less time asking "how" and "why" and more time asking "what if." **m**

See *Where to Buy* for contact information.

Contributing editor JIM HEID looks at a different aspect of Mac fundamentals each month. His latest books are *Macworld Complete Mac Handbook* (1991) and *Macworld Guide to Microsoft Word 5* (1992), both published by IDG Books Worldwide.

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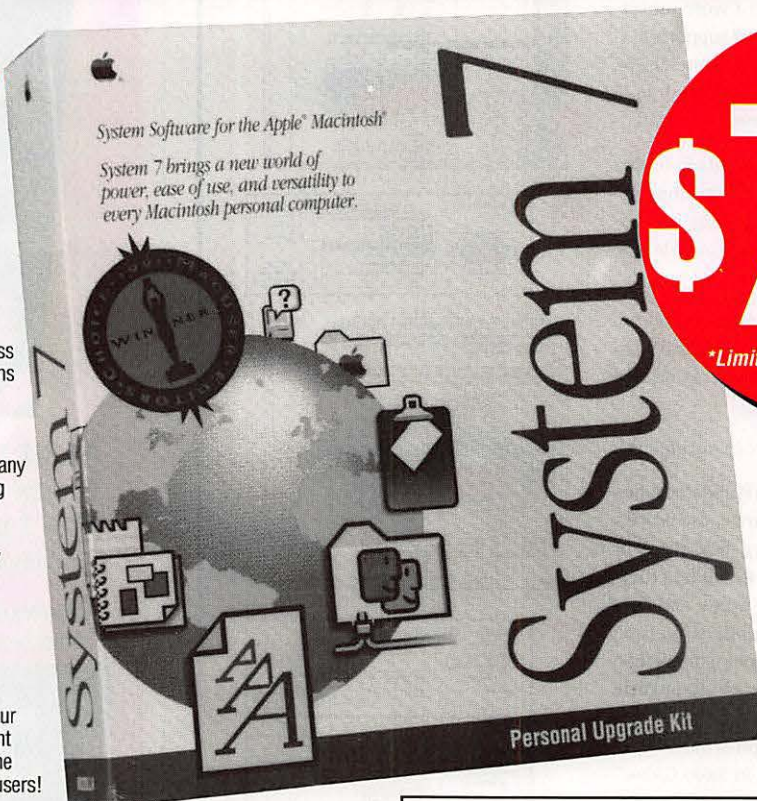
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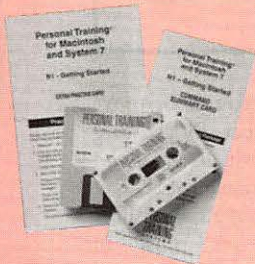
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MMW2T

HOW TO MICROSOFT WORD 5

Insights

BY ROBERT C. ECKHARDT

Tips for the Mac's most widely used application

For years, Microsoft Word users have had a love-hate relationship with their word processor. Thankfully, with the introduction of version 5, Word users have more reasons to love than hate. The shortcuts and techniques that follow cover both new and existing aspects of Word and are offered in the hope that they will tip the scale even more toward the positive side.

Some of the tips below were suggested by three of the most Word-literate people I know: Marianne Carroll, author of *Hands-On Word 5: Practical Solutions for Everyday*

Users (Brady, due summer 1992); Helmut Kobler, author of *The Little Mac Word Book* (Peachpit Press, 1992); and Jim Heid, author of *Macworld Guide to Microsoft Word 5* (IDG Books Worldwide, 1992). Assistance was also provided by the always helpful Microsoft Technical Support team.

Picturing Your Words

Special text effects are now possible with Word's new graphics tools. For small amounts of text, such as a single-line headline or a photo credit, enter the text directly in

the Picture window with the text tool. For larger amounts of text, such as a sideways caption for a sideways graphic, you may be better off entering and editing standard text in the document, converting the text into a graphic (by selecting the text and pressing option-⌘-D), pasting the graphic and then double-clicking on the graphic text to open the Picture window. In either case, once the text is in the Picture window, you can format, rotate, flip, reverse, and color it as needed.

To eliminate unwanted white space to the left of and above graphic text (or any

graphic image), move the text or the graphic (using ⌘-A to select all its parts) into the upper left corner of the Picture window. You can also crop the graphic itself by dragging it so that the unwanted portions disappear past the Picture window's top or left edge—this is the only way you can crop the left or top portion of a graphic in Word 5. To nudge the image once it's more or less in position, make sure the text or graphic is still selected in the Picture window and press the appropriate arrow keys. To eliminate white space to the right of and below a piece of graphic text or an image, back in the main document window, drag the bottom and right handles of the selected image. A little experimentation is usually required to get just the right amount of white space. (See "Custom Framing" for more about positioning graphics.)

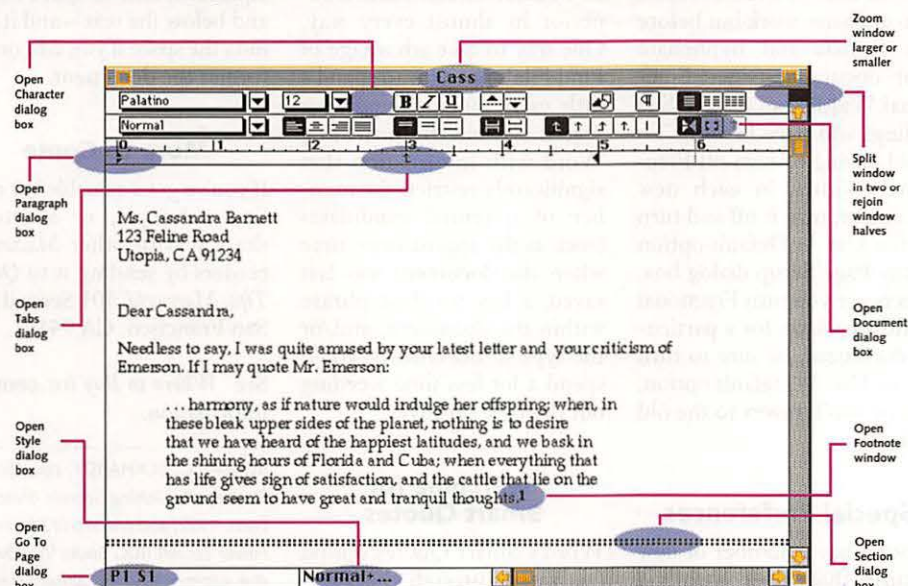
Ribbon, Right or Wrong

Rather than opening the Character dialog box (via the Other or Character command) to specify a nonstandard font size, it's much faster to use the ribbon, as long as it's already visible (it's the top strip of buttons and boxes in the document window). Just select the text to be formatted, click inside the ribbon's point box (the second box from the left),

continues

Hot Spots for Word 5

Double-click on these spots in the document window to perform a variety of tasks quickly.

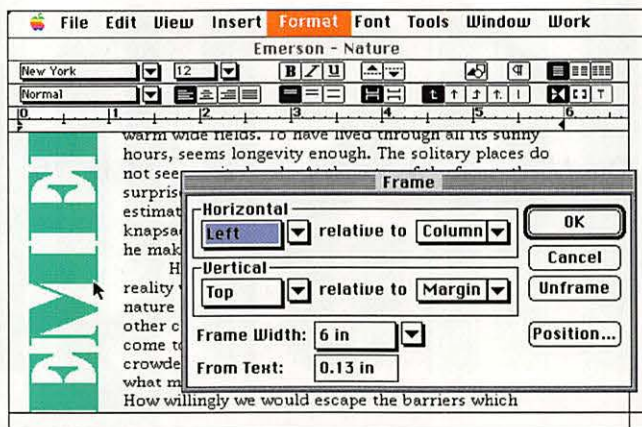


enter the desired point size, and press the return key. Subscripts and superscripts can also be formatted from the ribbon (using the two buttons to the right of the character style buttons), but the result is less than satisfactory. Although the selected character moves up or down the requisite 2 or 3 points, the character's point size remains unchanged—too big for a proper superscript or subscript.

You can get around this problem and still avoid opening the Character dialog box by using the superscript and subscript keyboard shortcuts, ⌘-shift-plus sign (+) and ⌘-shift-minus sign (-). (Note that I'm referring to the plus and minus keys on the main keyboard, not the numeric keypad.) These two key commands not only raise or lower selected characters but also reduce them to the next smaller standard point size. The keyboard shortcuts differ from the ribbon icons in one other respect as well. The ribbon icons toggle superscripting and subscripting on and off; the key combinations are not toggle commands and cannot turn existing superscripting and subscripting off. Instead, to return any characters superscripted or subscripted with key commands back to normal size and position, you must use the Revert To Style command (⌘-shift-spacebar).

No-Fault Default

When you install Word 5, you are asked to choose a default font and font size; Word uses these defaults each time it opens a new, untitled document. Much as in Word 4, you can change the default font and size by redefining the Normal style in the Style dialog box and clicking on the Use As Default button. But there's also a more obvious method: simply select Default Font from the Font menu (or open the Preferences dialog box and click on the Default Font icon) and choose the desired font and point size from the pop-up menu.



Custom Framing To edit the specifications of any existing frame (such as this rotated text), no matter how it was created, you can use the Frame dialog box, reached via the Format menu's Frame command.

Easy on the Eyes

The Page Setup dialog box's Fractional Widths option improves the appearance of proportionally spaced fonts (most PostScript and TrueType fonts) on the printed page, but most of the time it does just the opposite with on-screen text. In Word 4, Fractional Widths was turned off by default; you had to turn it on when you needed it. With Word 5, selecting the LaserWriter driver in the Chooser turns on Fractional Widths by default. (Fractional Widths is off by default if you select a non-PostScript printer.) For more readable on-screen text, you might want to turn off Fractional Widths. Turn it back on after you've done most text-intensive work but before you format and hyphenate your document (since Fractional Widths can change line endings and page breaks). To avoid having to turn off Fractional Widths in each new document, turn it off and turn on the Use As Default option in any Page Setup dialog box. Whenever you turn Fractional Widths back on for a particular document, be sure to turn off the Use As Default option, too, or you'll revert to the old default.

Special Preferences

Word 5 has a number of new features that you control via the Preferences dialog box.

One such feature is the File menu's list of the last four documents you've worked on; this list makes it easy to return to your most recent work. Those who are already conscientious about adding important documents to the Work menu (by pressing ⌘-option-plus sign [+], then clicking on the document's title bar or name in the Open dialog box) may find the File menu list redundant; they can turn it off in the View section of the Preferences dialog box (opened with the Preferences command, now near the bottom of the Tools menu).

Find Files Fast

Although the Finder's Find command is handy, Word's new Find File command is superior in almost every way. One way to take advantage of Find File's power is to spend a little extra time defining your search criteria. By providing Word with information that significantly restricts the number of potential candidates (such as the approximate time when the document was last saved, a key word or phrase within the document, and/or the type of document), you'll spend a lot less time weeding out the false positives.

Searching for Smart Quotes

Word's Smart Quotes option (activated through the Preferences dialog box in the

General section) gives you typographically correct, smart (curled) quotes instead of those ugly typewriter ones. If you have an old document containing dumb (uncurled) quotes, you can convert them to smart quotes in a flash using the Replace command. Be sure the Smart Quotes option is active, and then choose Replace. Next, type a single typewriter quote in the Find What box and the Replace With box. Click on Replace All, and Word changes all the quotes to typographer's quotes. To fix all double quotes, repeat the process, this time typing a double typewriter quote in the Find What and Replace With boxes.

Memos and Letters Suitable for Framing

Word's Frame commands (described in "Custom Framing") are most useful when creating complex layouts, but you also can apply them to an age-old formatting problem common in simple documents: how to vertically center the text in a one-page document such as a letter or memo. Here's how. Simply select all the text, and then choose Frame from the Format menu. When the Frame dialog box appears, configure the Vertical pop-up menus to read "center relative to page." Word then places equal amounts of space above and below the text—and it adjusts the space if you edit or reformat the document.

More to Come

If you've got a valuable Word 5 tip, technique, or shortcut, share it with other *Macworld* readers by sending it to *Quick Tips*, *Macworld*, 501 Second St., San Francisco, CA 94107. **m**

See *Where to Buy* for contact information.

ROBERT C. ECKHARDT, coauthor of *Desktop Publishing Secrets* (Peachpit Press, 1992) and *Macworld Macintosh Power Toolkit* (IDG Books Worldwide, due summer 1992), is already starting work on a book about Word 6.



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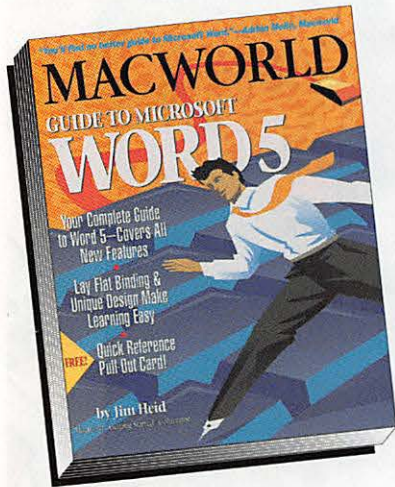
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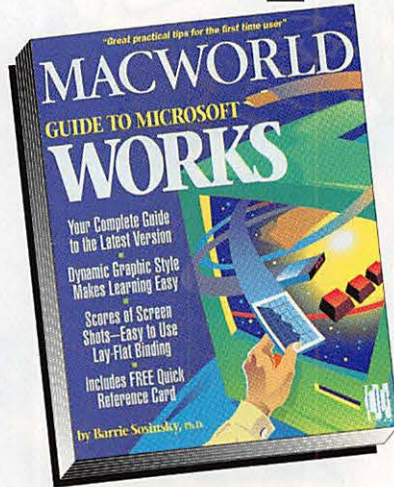
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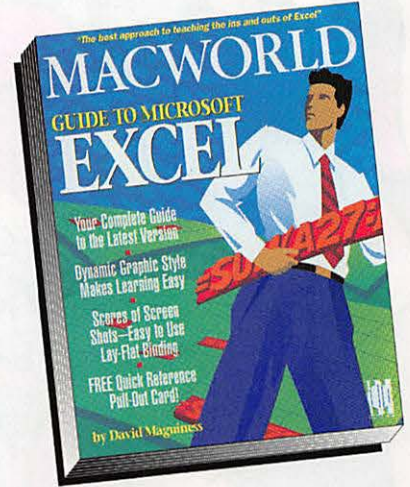
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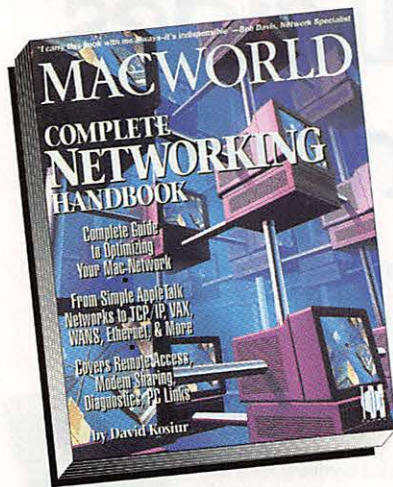
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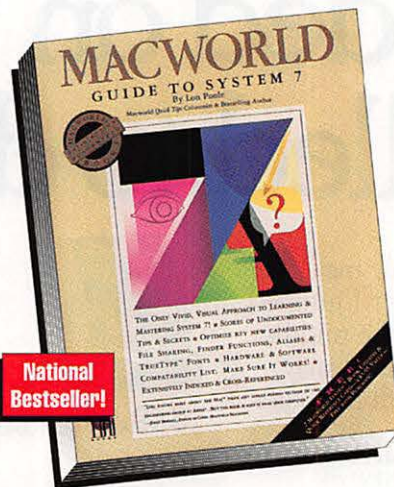
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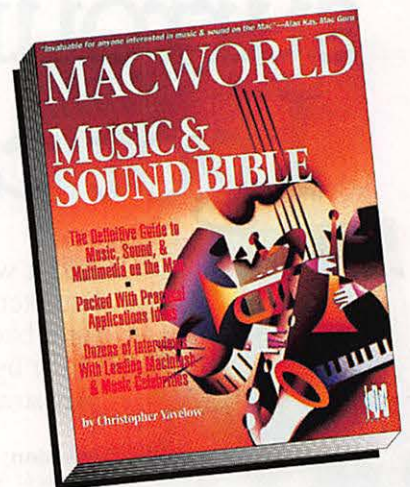
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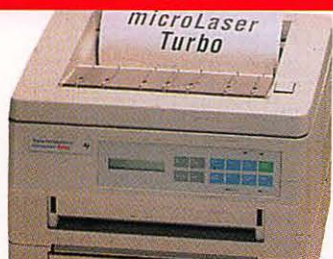
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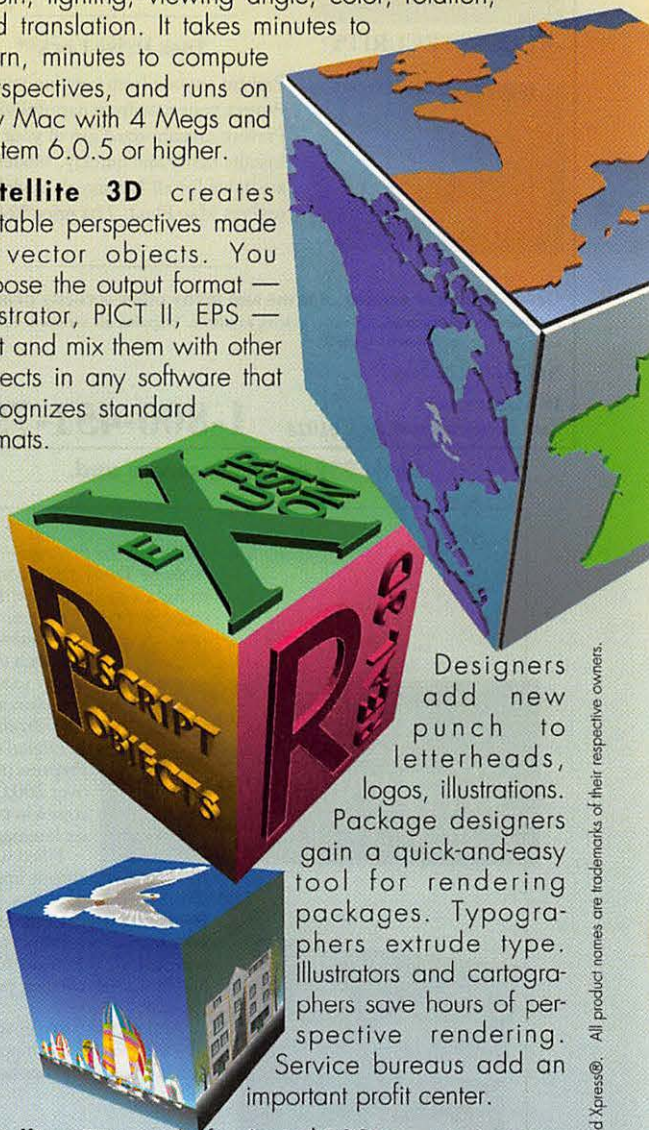
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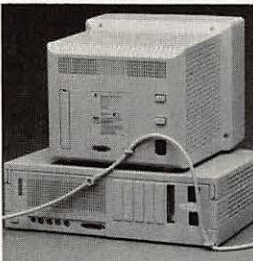
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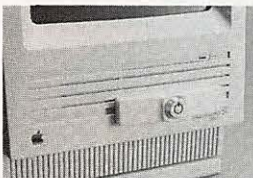
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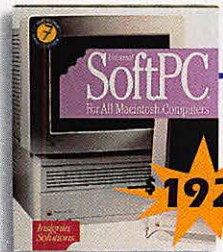
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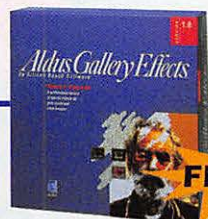
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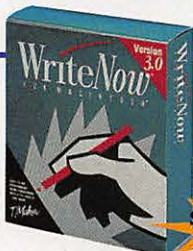


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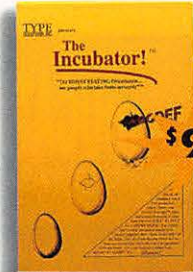


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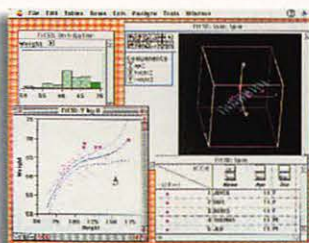
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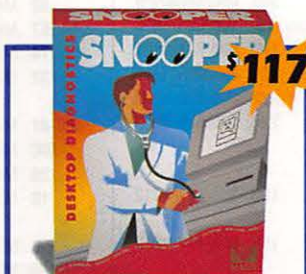
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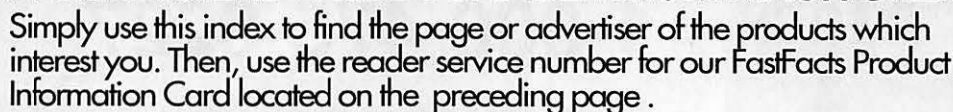
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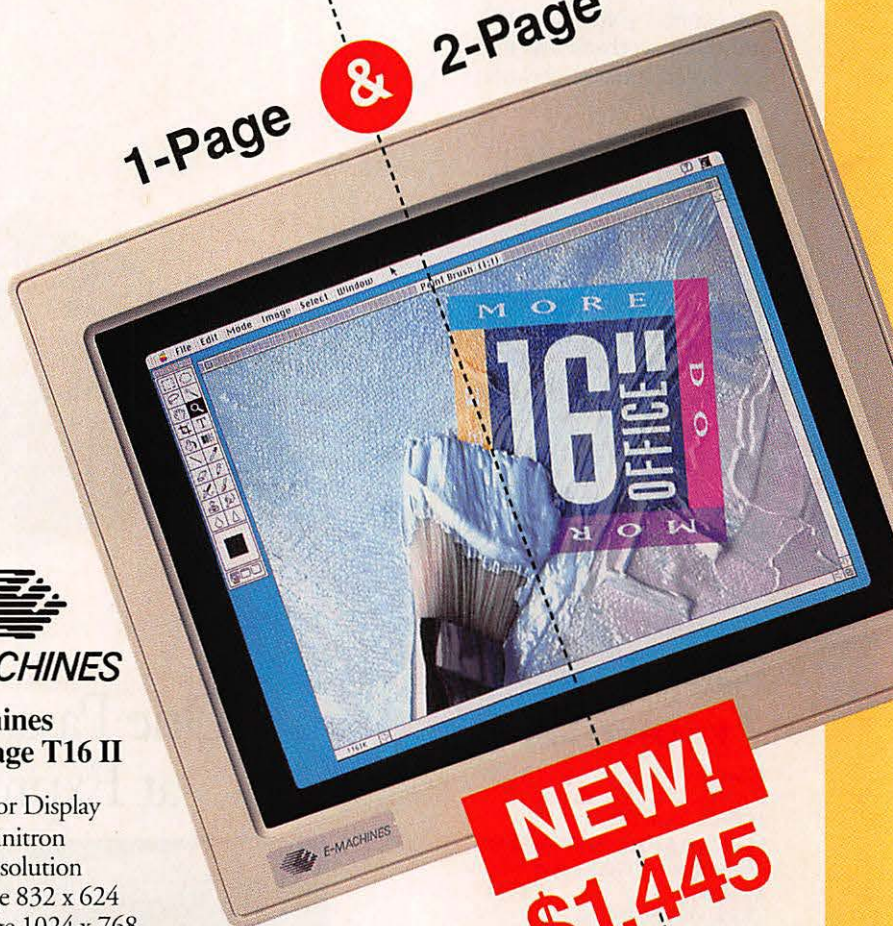
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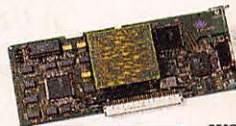
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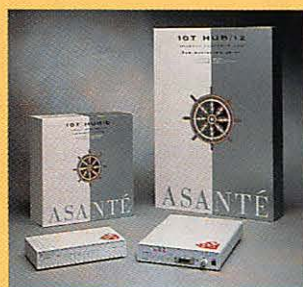
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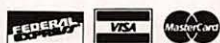
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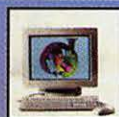
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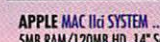
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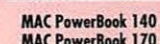
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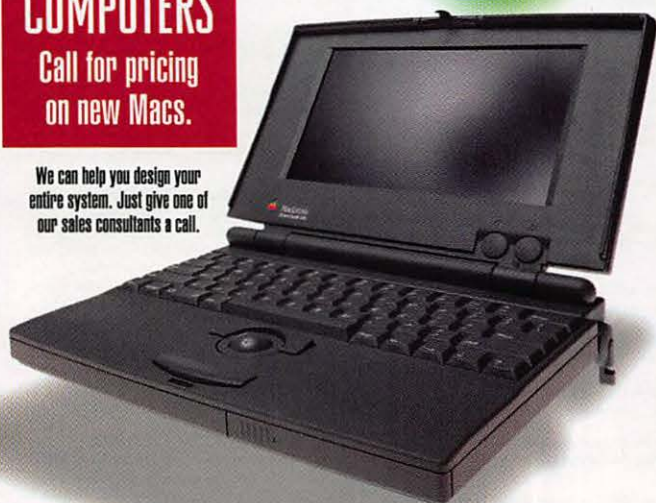
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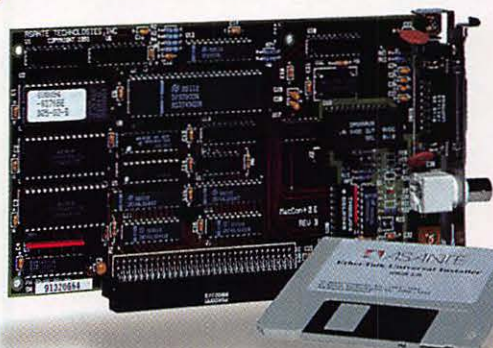
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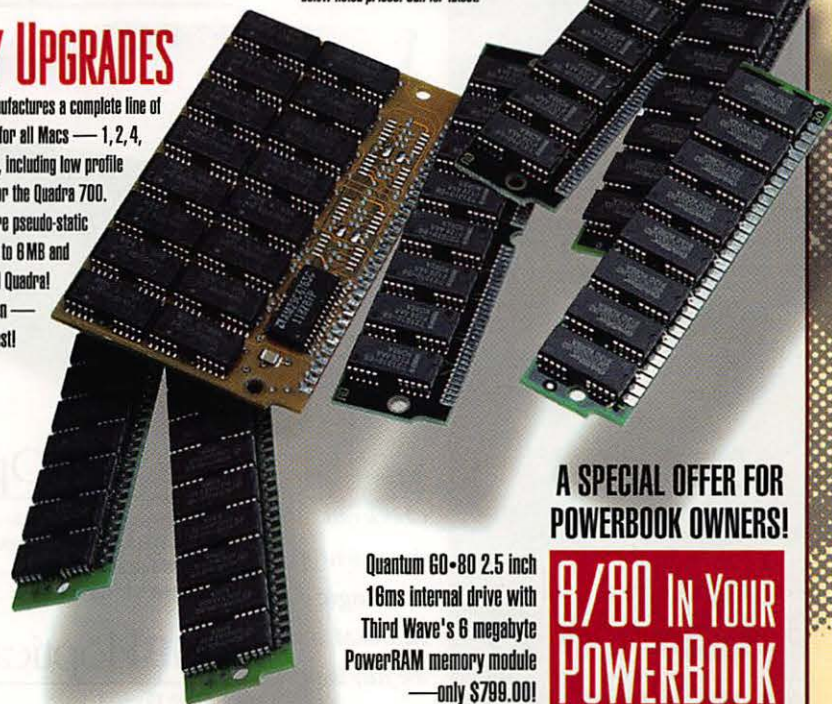
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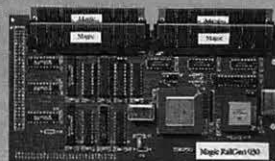
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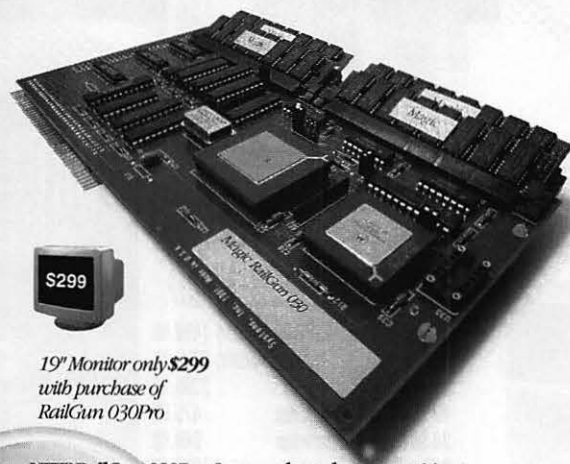
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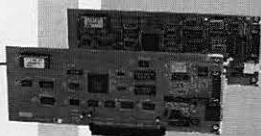
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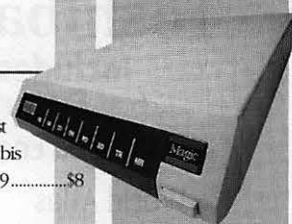
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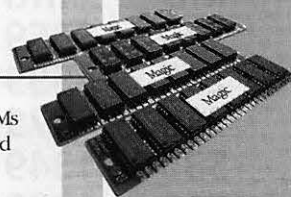
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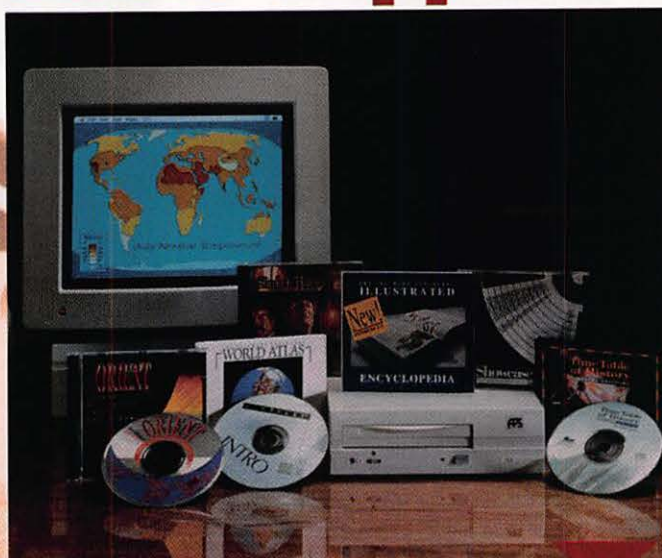
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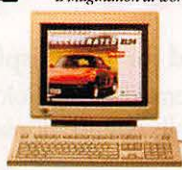
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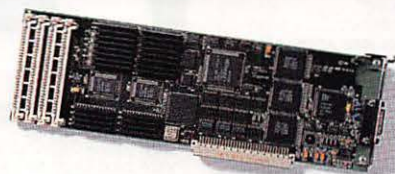
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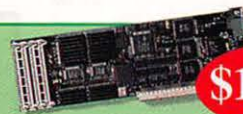
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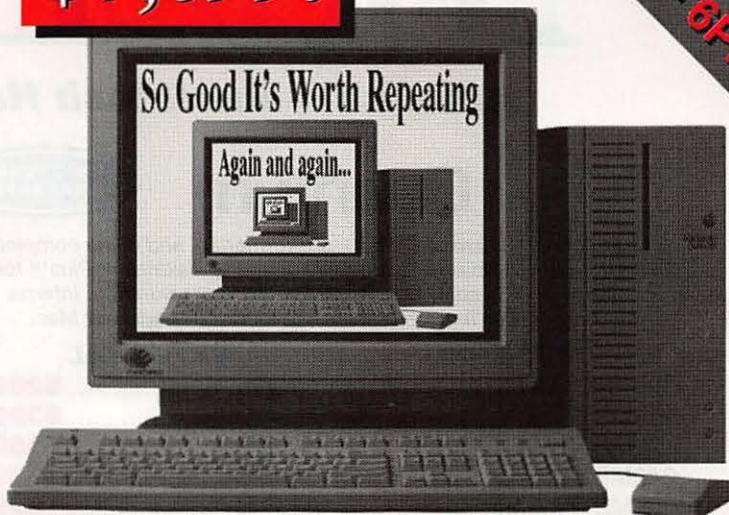
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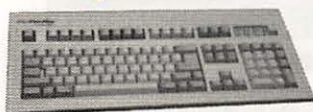
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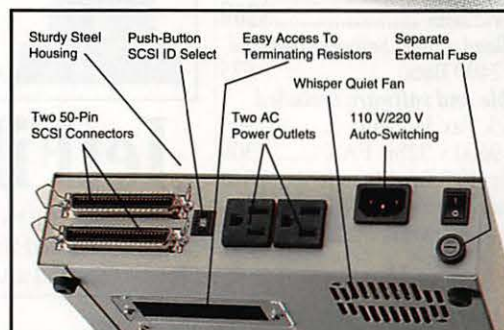


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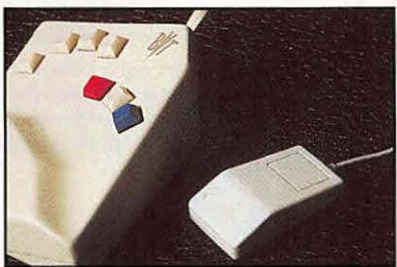
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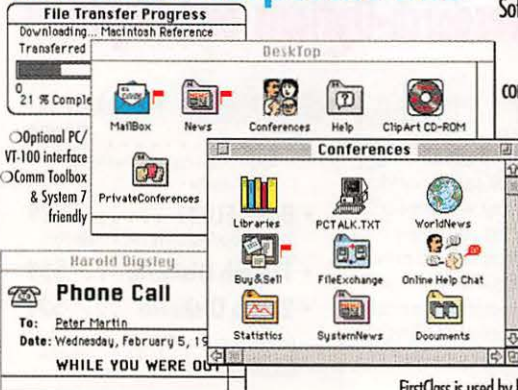
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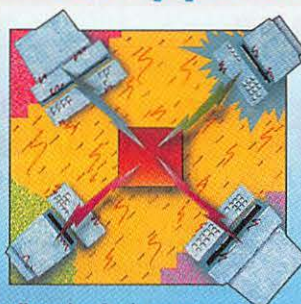
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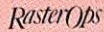
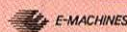
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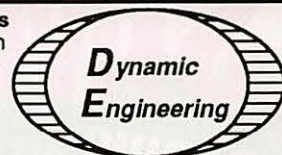
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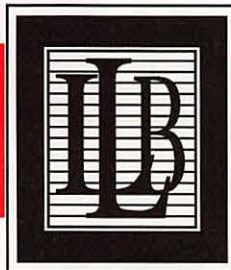
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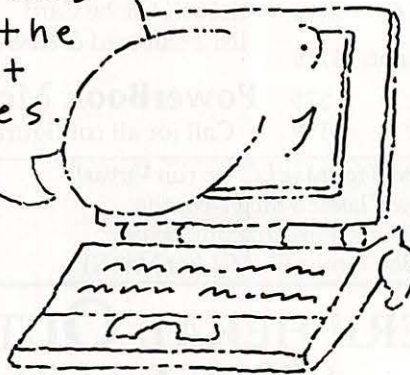
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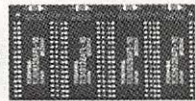
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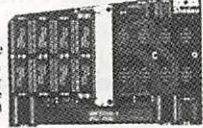
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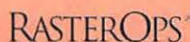
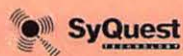
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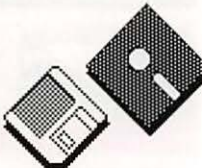
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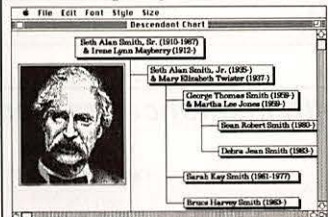
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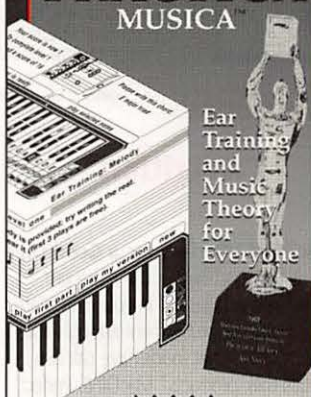
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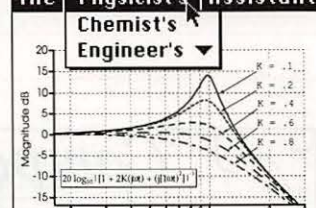
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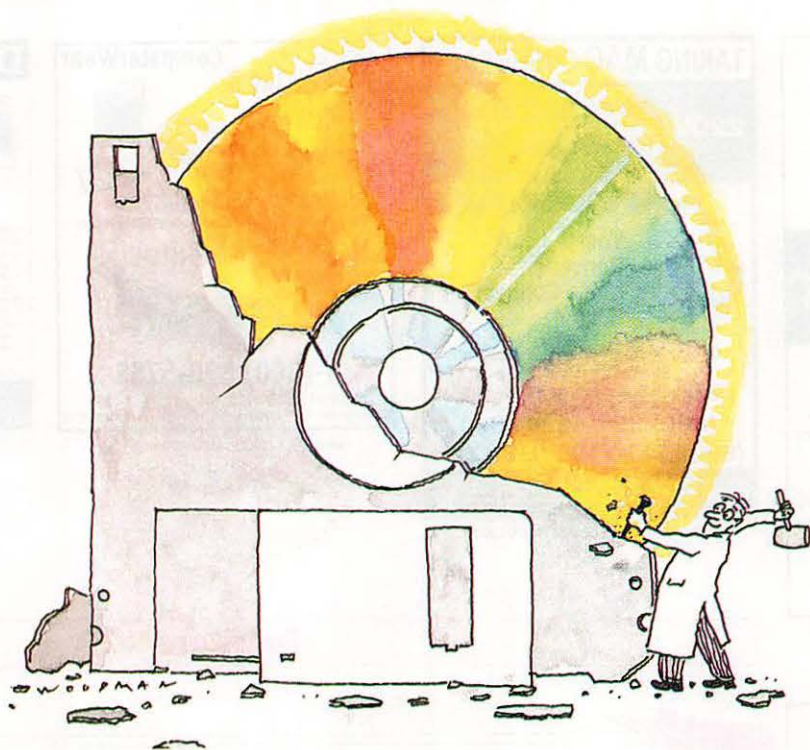
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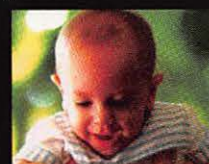
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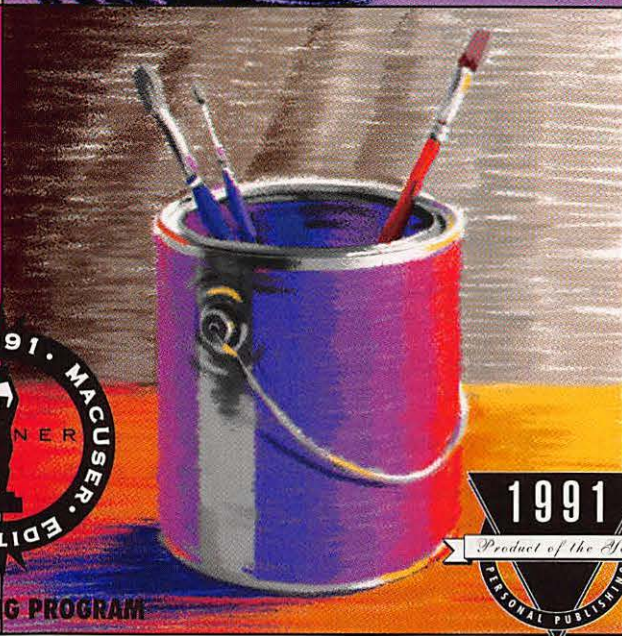
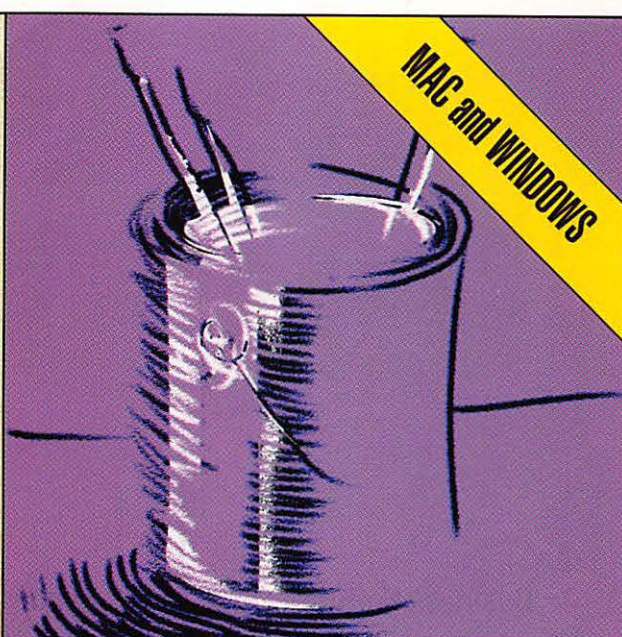
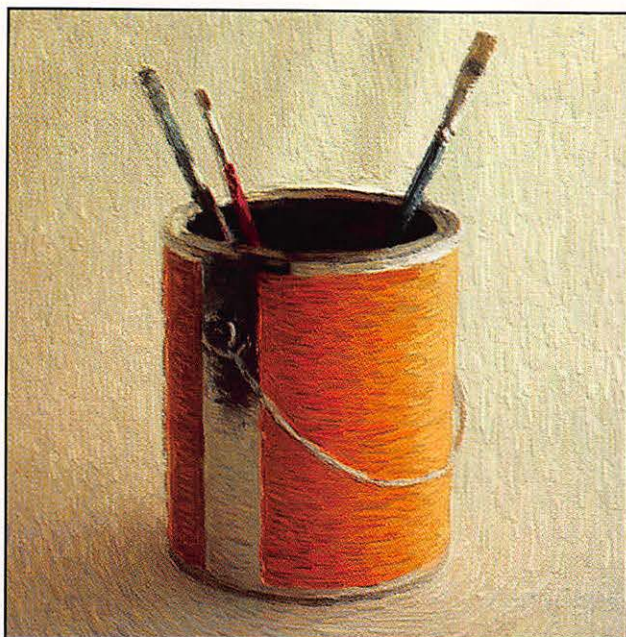


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Best-Sellers

JULY 1992

Months on chart
▼ Last month
▼ This month

Business Software

77	1	1	Microsoft Excel <i>Microsoft Corporation</i>
86	2	2	Microsoft Word <i>Microsoft Corporation</i>
8	3	3	Microsoft Office <i>Microsoft Corporation</i>
7	8	4	MacDraw Pro <i>Claris Corporation</i>
24	4	5	Quicken <i>Intuit</i>
38	12	6	WordPerfect for the Macintosh <i>WordPerfect Corporation</i>
1	—	7	1-2-3 for Macintosh <i>Lotus Development Corporation</i>
73	5	8	Aldus PageMaker <i>Aldus Corporation</i>
7	7	9	Aldus Persuasion <i>Aldus Corporation</i>
62	15	10	MacWrite II <i>Claris Corporation</i>
64	6	11	Microsoft Works <i>Microsoft Corporation</i>
62	10	12	MacDraw II <i>Claris Corporation</i>
19	14	13	Aldus FreeHand <i>Aldus Corporation</i>
38	13	14	FileMaker Pro <i>Claris Corporation</i>
4	—	15	Calendar Creator <i>Power Up Software Corporation</i>

Education Software

39	1	1	Where in the World Is Carmen Sandiego? <i>Broderbund Software</i>
53	4	2	Reader Rabbit <i>The Learning Company</i>
64	5	3	Math Blaster <i>Davidson & Associates</i>
13	—	4	Math Rabbit <i>The Learning Company</i>
20	2	5	Where in Time Is Carmen Sandiego? <i>Broderbund Software</i>

Months on chart
▼ Last month
▼ This month

Entertainment Software

26	1	1	Tetris <i>Spectrum HoloByte</i>
30	3	2	SimCity <i>Maxis</i>
51	2	3	Microsoft Flight Simulator <i>Microsoft Corporation</i>
15	—	4	Crystal Quest <i>Casady & Greene</i>
29	5	5	Falcon <i>Spectrum HoloByte</i>

Network/Data Communications

32	1	1	PhoneNet <i>Farallon Computing</i>
55	2	2	AppleShare <i>Apple Computer</i>
18	3	3	MacLink Plus <i>DataViz</i>
1	—	4	AppleTalk Remote Access <i>Apple Computer</i>
17	—	5	White Knight II <i>Freesoft Corporation</i>

Add-In Boards

15	1	1	Macintosh IIsi NuBus Adapter Card <i>Apple Computer</i>
19	3	2	Macintosh Display Card 8•24 <i>Apple Computer</i>
1	—	3	Macintosh II FDHD Upgrade <i>Apple Computer</i>
16	2	4	Pivot <i>Radius</i>
6	5	5	MacCon+ 30i Ethernet Card <i>Asanté Technologies</i>

Months on chart
▼ Last month
▼ This month

Utility Software

14	1	1	After Dark <i>Berkeley Systems</i>
25	3	2	SAM <i>Symantec Corporation</i>
4	2	3	More After Dark <i>Berkeley Systems</i>
15	4	4	Virex <i>Microcom</i>
20	—	5	The Norton Utilities for the Macintosh <i>Symantec Corporation</i>

The AmCoEx Index of Used Mac Prices

Machine/RAM/ Hard Drive	Average Sale Price	Monthly Change
Mac Plus/1MB/none	\$350	-100
Mac Plus/2MB/20MB	\$550	-150
Mac SE/2MB/20MB	\$850	+25
Mac Portable/1MB/40MB	\$1200	-100
Mac Classic/2MB/40MB	\$800	0
Mac SE/30/2MB/40MB	\$1675	-125
Mac LC/2MB/40MB	\$1100	0
Mac II/4MB/40MB	\$1800	+75
Mac IIsi/3MB/40MB	\$1900	0
Mac IICx/4MB/80MB	\$2325	+25
Mac IIfx/4MB/80MB	\$3000	+100
Mac IIfx/4MB/80MB	\$4000	-200
Apple 12-inch B&W display/board	\$250	0
Apple 13-inch RGB display/board	\$675	+50
LaserWriter Plus	\$1100	0
LaserWriter IINT	\$1750	-50

Index provided by the American Computer Exchange of Atlanta, Georgia. It reflects sales during week of April 21. Configurations include keyboard and exclude monitor and display board for noncompact models.

Source: Exclusive Audits & Surveys research from more than 250 Macintosh retailers and selected mail-order vendors. Covers sales during March 1992.

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MacWorld, October 1991

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"...excellent performance, solid construction, and convenient features..."

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MacUser, June 1991

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MacUser, December 1991

"...excellent features at a very competitive price."
MacWeek, January 27, 1992

"Fast and accurate; inexpensive."

"...the Mirror 600 the best value around."
MacWorld, April 1992

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EDITORS'
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"Editor's Choice. The overall best buy is the Mirror 210 hard drive."

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MacWorld, February 1992

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MacUser, April 1992

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"...an excellent combination of value, speed, service and package. The Mirror 105 is inexpensive, well-packaged...with good service and warranty."
MacUser, November 1991

★★★★

MW
EDITORS'
CHOICE

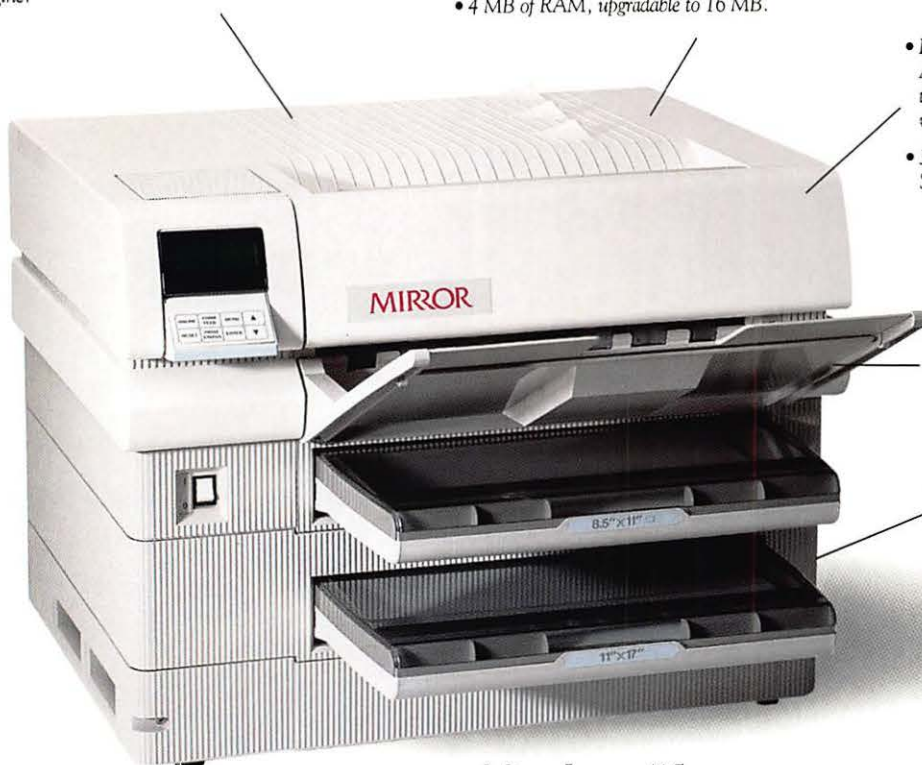
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- The smallest 11 x 17 printer available. True 400 dpi resolution and a rugged 15 page-per-minute print engine.

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- RISC processor and genuine Adobe PostScript Level 2; handles the toughest jobs with ease. Your work will look great and print fast.
- 35 Adobe fonts built in, plus SCSI port for connecting font drives.



- Manual feed tray

- Two high capacity paper trays. Easy to use tray selector software lets you keep tabloid and letter size paper loaded all the time.

MirrorImage 415

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Seen The Fine Print.

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MirrorImage 309

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LASER PRINTER PRICE/PERFORMANCE RATIO

MirrorImage 309	\$1,999
Personal LW NT	\$2,000
LaserWriter IIg	\$4,000
LaserWriter IINT	\$3,000



our test page

We measured the average time to print our Quark Xpress test page from a PowerBook 140 connected directly to each printer. All printers were in stock configurations, with no font drives or additional memory. The performance index was calculated by taking the inverse of (street price/inverse of print time).

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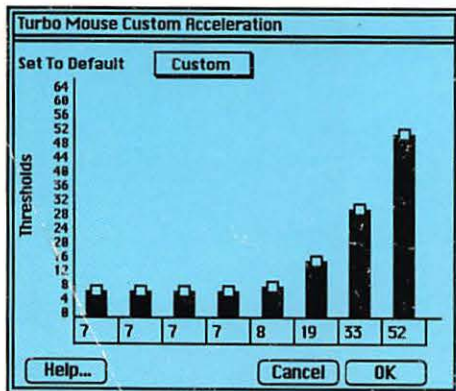
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